Commodore

A 2024 Monitor

Service Manual

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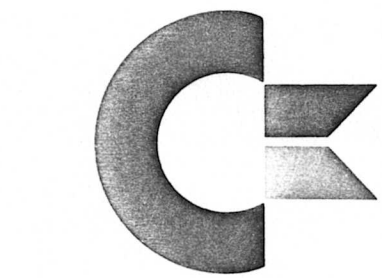

Commodore

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SERVICE MANUAL

A2024
MONITOR

FEBRUARY, 1991 **PN-400402-01**

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SECTION 1

SPECIFICATIONS

1.1 ENGINEERING SPECIFICATIONS

CATHODE RAY TUBE (CRT)

Size	15 inch diagonal
Pitch	0.31 mm
Deflection Angle	110 degrees
Neck Diameter	29 mm
Face Treatment	anti-glare
Phosphor	H192/H212

POWER REQUIREMENTS

Power source	AC 110/220V
Power consumption	60 watts

DEFLECTION CHARACTERISTICS

Horizontal frequency	56.25 KHz
Horizontal blanking pulse	3.55 usec maximum
Vertical frequency	50 Hz non-interlaced (PAL); 63 Hz non-interlaced (NTSC)
Vertical blanking time	1.635 msec

VIDEO RESPONSE

Bandwidth	80 MHz (-3dB)
Rise time	6 nsec
Fall time	6 nsec
Horizontal resolution	1024 pixels
Vertical resolution	1024/800 lines

DISPLAY FORMAT

Character Format	8 x 14/8 x 16/9 x 16 matrix
Capacity	80 characters x 25/30 rows

INPUT SIGNAL

Signal type	analog
Video signals	1.5 V_{p-p}
Horizontal drive	TTL 3 V_{p-p}
Vertical drive	TTL 3 V_{p-p}

DISPLAY PERFORMANCE

Picture size	
Horizontal	260 mm ±3 mm
Vertical	295 mm ±3 mm

GEOMETRY AND LINEARITY DISTORTION

Geometry distortion	
Linearity	Character height and width will not vary for more than 10% from the average character size.

EXTERNAL CONTROLS

- Brightness
- Contrast
- Power On/Off switch
- Vertical size
- Vertical hold
- Enable control
  Enables the 2024 high resolution operation. This switch is factory set to the left most position as you face the back of the monitor. It should remain in this position for extended mode (high resolution) operation.
- Tune control
  Used to fine tune the screen for sharper images.

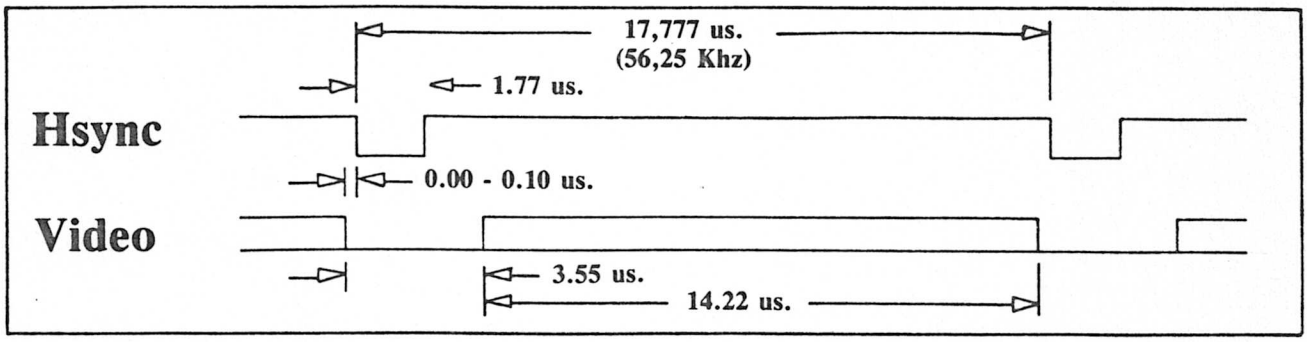
1.1 ENGINEERING SPECIFICATIONS (Continued)

VIDEO CABLE INPUT SIGNALS

Pin 1	No connection	
Pin 2	No connection	
Pin 3	No connection	
Pin 4	No connection	
Pin 5	No connection	
Pin 6	DI	digital intensity
Pin 7	DB	digital blue
Pin 8	DG	digital green
Pin 9	DR	digital red
Pin 10	No connection	
Pin 11	H-sync	horizontal sync
Pin 12	V-sync	vertical sync
Pin 13	No connection	
Pin 14	No connection	
Pin 15	C1	clock out
Pin 16	Gnd	Ground
Pin 17	Gnd	Ground
Pin 18	Gnd	Ground
Pin 19	Gnd	Ground
Pin 20	Gnd	Ground
Pin 21	No connection	
Pin 22	No connection	
Pin 23	No connection	

TIMING CHART

Horizontal normal display time



A2024 VIDEO TIMING SPECIFICATION

SECTION 2

THEORY OF OPERATIONS

INTRODUCTION

The explanations in this section assume that you are familiar with the Amiga computer and its commands, techniques and procedures used in operating it, as described in the Introduction to the Amiga manual for the A500, A1000 and A2000 computers.

2.1 PRODUCT DESCRIPTION

The 2024 is a paperwhite (gray scale) display device capable of providing very high resolution screen displays — 1008 x 800 pixels for NTSC Amiga systems and 1008 x 1024 pixels for PAL systems — in up to four levels of gray.

The descriptions in this manual assume that the reader is familiar with the Amiga computer and its commands, techniques and procedures used in operation.

2.2 SYSTEM REQUIREMENTS AND COMPATIBILITY

The 2024 requires an Amiga computer having at least 1 Mbyte of memory, with a minimum of 512 KBytes of chip memory. The 2024 will function with either NTSC or PAL Amiga computers.

You can connect the 2024 to a standard model Amiga 2000 computer right out of the box. To use an Amiga 500 computer with the 2024, an internal A501 memory board must be installed. To use an Amiga 1000 computer with the 2024, you must upgrade to at least 1 MByte of memory.

In the normal mode the 2024 is generally compatible with all Amiga softwares that have been produced in accordance with the official Commodore-Amiga software development guidelines and constraints. Normal mode programs which open and operate in the 2024 WorkBench screen may have improved text and graphics displays (i.e., in the normal mode, the 2024 deinterlaces any interlaced Amiga display — that is, a 400-line or 512-line interlaced display is presented non-interlaced, and without flicker). New programs can open their own high resolution screens in a system standard fashion.

For technical reasons, the 2024 is not recommended for use with animation displays. Also, there are certain restrictions in extended mode on simultaneous display of multiple screens. For more details on these and other topics, see the README files on the Jumpstart disk. (The Jumpstart disk is included in the 2024 monitor package.)

2.3 CONNECTING THE MONITOR TO THE COMPUTER

One end of the monitor cable is permanently attached to the monitor. The free end of the cable has a 23 pin connector. Plug this end of the cable into the port marked RGB or VIDEO on the back of the Amiga computer.

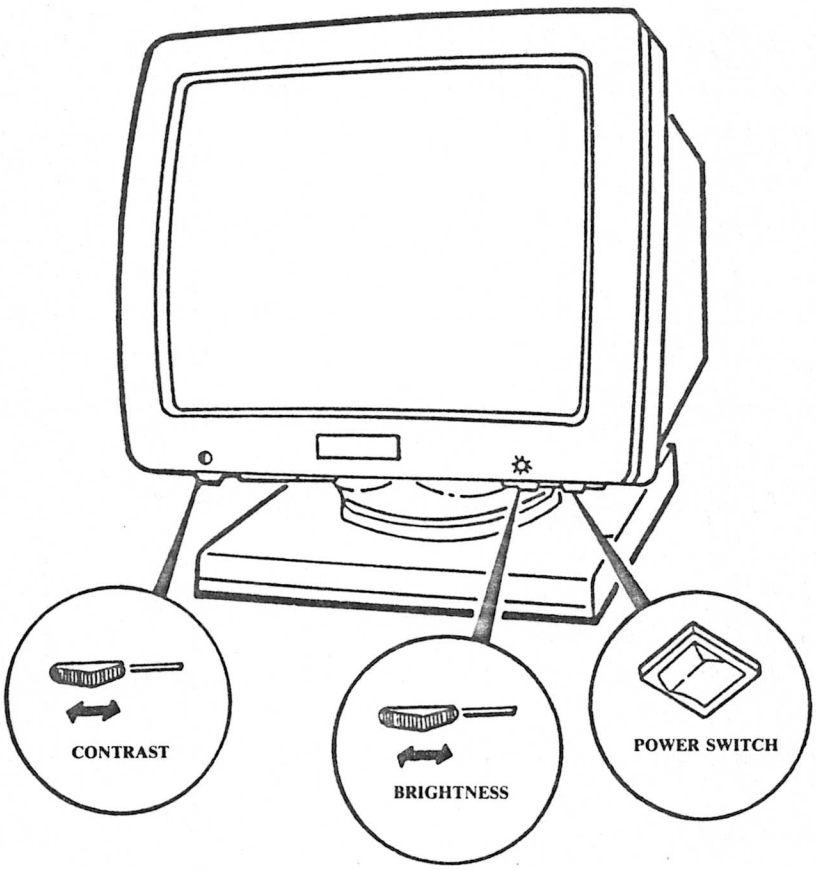
After connecting the monitor to the computer, plug the female end of the monitor's power cord into the three-pronged receptacle at the back of the monitor. Plug the male end of the power cord into a three-hole AC power receptacle. This AC receptacle may be floor mounted, or you may use a safety approved power strip.

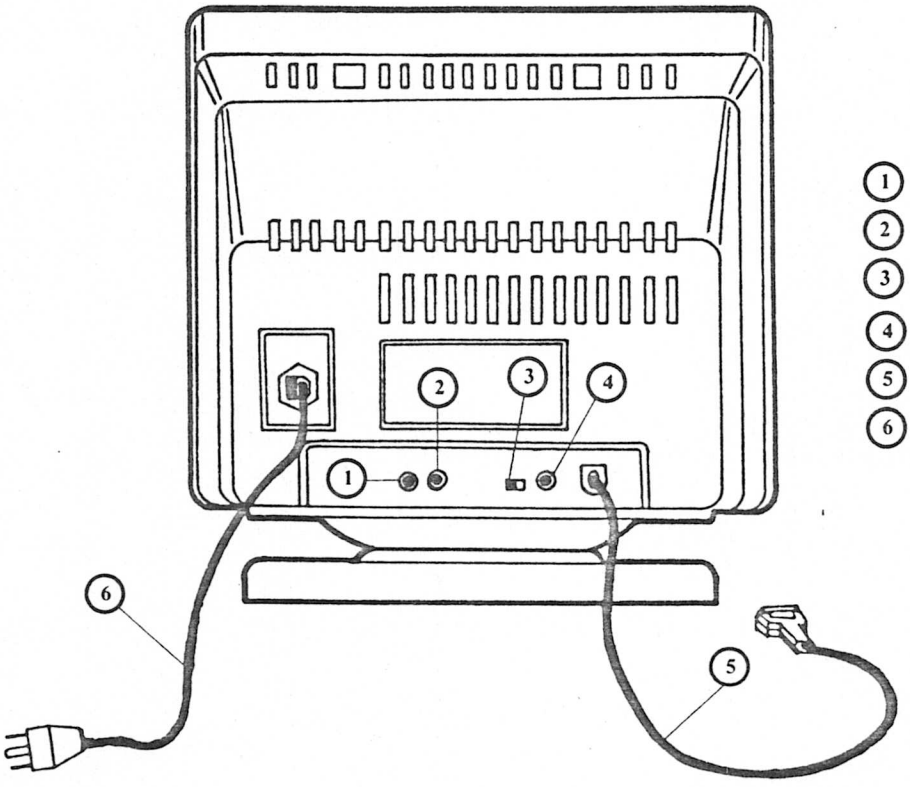
CAUTION: Before you connect the monitor to the computer, turn OFF power to both the monitor and the computer.

2.4 MONITOR DISPLAY CONTROLS

You can adjust the monitor display with the following controls:

Contrast	Increases or decreases contrast. Adjust to your preference.
Brightness	Increases or decreases brightness. Adjust to your preference.
Vertical size	Adjust the vertical positioning of the screen.
Vertical hold	Stops the vertical scrolling of the picture.
Enable	Enables the high resolution operation. This switch is factory set to the leftmost position as you face the back of the monitor. This switch should remain in this position for extended mode (high resolution) operation.
Tune	Fine tunes the screen for sharpest image.





1. Vertical Size
2. Vertical Hold
3. Enable Control
4. Tune Control
5. Video Cable
6. Power Cable

2.5 NORMAL AND EXTENDED MODES

To use the 2024 in the normal mode, simply follow steps 1 through 4a below.

There are two methods of using the 2024 in the extended mode. One method is to use the system supplied icons or commands in the order listed below:

- Jumpstart. Assures up-to-date system libraries.
- SetMonitor. Informs system of the presence of the 2024.
- Preferences. Declares user desire for the extended mode screen.
- ResetWB. Actually invokes the extended mode screen.

Please refer to the monitor user's manual for more command details.

The second method of running in the extended mode is to allow the supplied start-up sequence to perform these steps automatically. This is outlined in detail below. The description assumes that you have made all the necessary equipment connections, and that the computer and monitor are turned off, and that no changes have been made to the factory-set choices of Preferences. For additional information on the start up sequence and commands, see your Amiga manuals.

Step 1. Turn on the monitor by reaching under the right front side of the monitor and moving the power switch to the On position. The power indicator light on the front of the monitor will go on.

Step 2. Turn on the Amiga computer. If your 2024 system is set up correctly, a monochrome gray display in normal resolution should appear on the monitor.

Step 3. Follow the normal startup procedure. When the WorkBench Hand screen appears and asks you to insert the WorkBench diskette into df0:(drive0), insert the A2024 Jumpstart diskette provided with your monitor.

CAUTION: Do not rename the JumpStart disk.

Step 4. Wait for the startup sequence on the diskette to check the version of the system libraries, which must be greater than or equal to 35 for extended mode operation.

a. If your system has version 1.3 or earlier of the system ROMs, the library versions will be less than 35 and the system will ask if you want the new library installed. If you answer Yes, then the system executes a ramkick (see the The JumpStart Icon section on the user's manual), and reboots with the new libraries installed. If you answer No, the system displays the normal mode Workbench and you can proceed as usual, without going through the remaining steps.

b. If your system has version 2.0 or later of the system ROMs, the library versions will be equal to or greater than 35. The system will not ask you if you want the libraries installed but will proceed to step 5 below instead.

Step 5. The startup sequence automatically executes a Setmonitor command. This notifies the system that a 2024 monitor is attached. The system will never boot in extended mode unless the SetMonitor command has been run first.

Step 6. The startup CLI screen will then ask: Do you wish to reset the Workbench? Type Y for "Yes" and press Return. The Workbench will close and reopen again in extended mode, provided that A2024 operation is enabled in Preferences. This is how the disk is set when shipped.

Step 7. Adjust the Tune control (located at the rear of the monitor) as necessary for the sharpest screen display. For your convenience, a special display window called Tune has been provided. When you open this window by double clicking on the Tune icon, you will see a display of vertical lines. Adjust the Tune control until all of the vertical lines in Tune window are smooth without jagged edges.

Step 8. Readjust the 2024 setting in preferences as desired. See Setting 2024 Preferences for details on how to do this. If you change the monitor settings for the WB Interlace settings in Preferences, you must use the ResetWB icon to close and reopen the Workbench in order for the new settings to take effect.

You should now have successfully installed and opened the high resolution display. If no screen display appears, check all the connections and then repeat the procedure described above.

2.6 SETTING A2024 PREFERENCES

At the middle of the Preferences screen there are three gadgets: **OFF, 10 Hz** and **15 Hz.** The **OFF** gadget disables the extended mode (high resolution) WorkBench screens and enables normal mode. The terms **10 Hz** and **15 Hz** refer to the number of times per second that the extended mode RGBI video display data is transmitted from the Amiga to the 2024.

- The **10 Hz** setting, which is the default setting for the extended mode, minimizes possible contention for system resources and is well-suited to such task as text editing, where the display does not require very frequent updating.

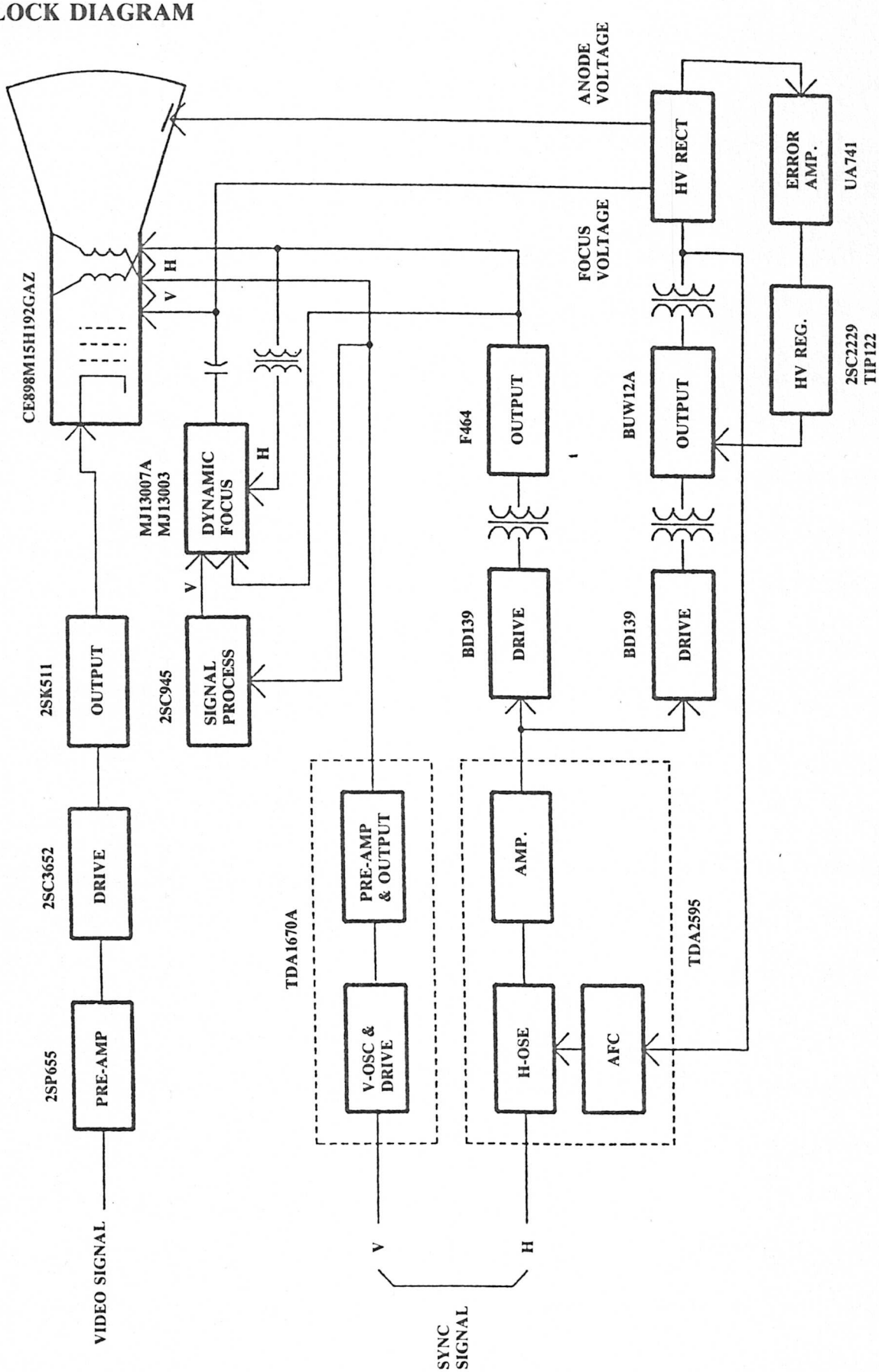
- The **15Hz** setting offers a better picture by virtue of more frequent display updates. However, these frequent updates may impact system performance or throughput in other areas.

When you have made the Preferences choices, you can exit the Preferences program either by **SAVE**ing your choices to the Jumpstart disk, or by simply **USE**ing your choices for the current session. You can also use **CANCEL** to exit Preferences without making any changes.

Remember that after changing a setting in Preferences, you must use ResetWB to close and reopen the Workbench before the new setting will take effect.

For a technical description of the video data transfer process, see the README files on the Jumpstart disk.

2.7 BLOCK DIAGRAM



2.8 POWER SUPPLY MODULE

GENERAL

The AC supply voltage may be either 115V or 230V selectable through internal jumper settings.

The input voltage (115/120V AC or 230/240V AC) supplied through the filter is rectified by the rectifying diode D901 to D904 and smoothed by input capacitors C908, C909 to provide a DC coarse-rectified voltage which is to be switched by main transistors Q901 and Q902, and delivered as 100V, 12V, 5V through T901.

The 100V output voltage is fedback to a detector circuit, and compared with its reference voltage. Any error signals from the detector circuit are fedback to a control circuit through a photocoupler U902. The control circuit generates an appropriate drive pulse to control the ON time of the main transistors Q901 and Q902, stabilizing the output at 100V.

The switching frequency is controlled so as to be synchronous with the horizontal deflection signal.

AC VOLTAGE RANGE SELECTION

With this power supply, when an input of 115V AC is supplied, J919 should be shorted. J919 should be open for 230-Volt operation.

2.9 VERTICAL DEFLECTION CIRCUIT

The vertical deflection circuit is made up of a vertical oscillator and a vertical driver. The V-sync enters U601 (TDA1670) pin 5 for vertical signal management.

U601 contains a vertical drive, vertical output and an amplifier circuit. Output is generated from U601 pin 2 and is sent as the vertical deflection current to the vertical DY.

VERTICAL OSCILLATOR AND VERTICAL DRIVER

The vertical oscillator and driver circuit U601 generates the sawtooth voltage starting at the rising edge of the V-sync pulse and controls the output amplifier circuit.

VR601 (V-hold) not only controls the free-running frequency of the vertical oscillator when the V-sync pulse is lost, but also controls the triggering sensitivity for detecting the V-sync signal.

HEIGHT AND VERTICAL LINEARITY CORRECTION

The picture height and the vertical linearity are functionally adjusted by controlling the feedback gain from the vertical driver to the vertical oscillator. VR602 controls the linearity and VR603 controls picture height.

2.10 HORIZONTAL DRIVE CIRCUIT

To produce a display raster, the electron beam is simultaneously moved horizontally, to produce a horizontal line as it strikes the phosphor screen, and vertically, to prepare for the next line. The deflection is produced by two sets of coils, H-yoke and V-yoke, placed at right angles to each other around the neck of the tube.

The horizontal pre-drive pulse output from U801 pin 4 is input to Q806, then it passes through T803 to turn on the horizontal output transistor Q807.

In the first half of the scanning period, the horizontal scanning current (sawtooth current) goes through D816, D802, DY (deflection yoke), L803, L802 and C815.

In the second half of the scanning period, the current reverses direction and passes through C815, L801, DY and Q803, L802 and L803.

In the retrace period, Q803 turns Off and the current passes through C821, DY, L802, C815 and changes direction in the middle of retrace, in accordance with the LC resonance of C821 and DY. L802, located in series with DY, is a non-linear variable inductance for horizontal linearity compensation.

2.11 HORIZONTAL OUTPUT CIRCUIT

The signal for T803 turns on and off the horizontal output transistor Q807. Consequently, a damper diode D807 and Q807 are turned On and Off alternately so that the sawtooth currents flow into the horizontal deflection coil.

The fly-back transformer T804 boosts up the Q807 output to approximately 17 KV at the time of cut off CRT anode current.

2.12 HIGH VOLTAGE POWER SUPPLIES

CRT ANODE VOLTAGE (17 KV POWER SUPPLY)

The high voltage power supply is derived from the switching transistor Q807, flyback transformer T804 and the high voltage stabilizing circuit, which has similar construction and operation principles as the horizontal driving circuit.

The energy stored in the primary side of T804 when Q806 is ON is released as high voltage to the secondary side of T804 as Q807 turns off during the horizontal blanking period. This high voltage is then rectified to 17KV and supplied to the CRT anode.

FOCUS VOLTAGE

The focus voltage is derived from a voltage divider off T802 (scan choke) and supplied to grid G4 of the CRT.

T802 also controls the focus, brightness, sub-bright, B2, G1, G2 and G4 voltages.

CRT SCREEN GRID VOLTAGE

By rectifying the high voltage pulse generated at transistor Q803, a constant DC voltage of approximately 950V is obtained for EG2. This voltage at EG2 is divided by the variable resistor VR805 and supplied to the CRT screen grid G2. T802 also provides -112V biasing voltage for EG1.

BLANKING CONTROL

To blank the vertical raster while the scanning lines are in their retrace, The V.Blank signal from IC601 is fed to Q602, which biases the first grid (VG1) of the CRT tube to low and cuts off when these signals are applied.

2.13 VIDEO AMPLIFIER

The video signal from the logic board is sent to the cascade amplifier of Q702 and Q703 for wideband amplification.

SECTION 3

TROUBLESHOOTING

3.1 ADJUSTMENTS AND TESTS

PICTURE SIZE ADJUSTMENT

1. Adjust H-Width (L803) so that the horizontal picture width may be 260 mm.
2. Adjust V-Size (VR603) so that the vertical picture height becomes 195 mm.

FOCUS ADJUSTMENT

Adjust the focus VR (VR804) so that the best focus may be obtained over the entire display area.

DEFLECTION YOKE AND CENTERING RINGS

Loosen the deflection yoke clamp and carefully move the yoke on the neck of picture tube as forward as possible. Rotate the yoke until the top and bottom edges of the raster are straight. Tighten the clamp center of the raster and eliminate the shaded corners by rotating the centering rings until the best effect is obtained.

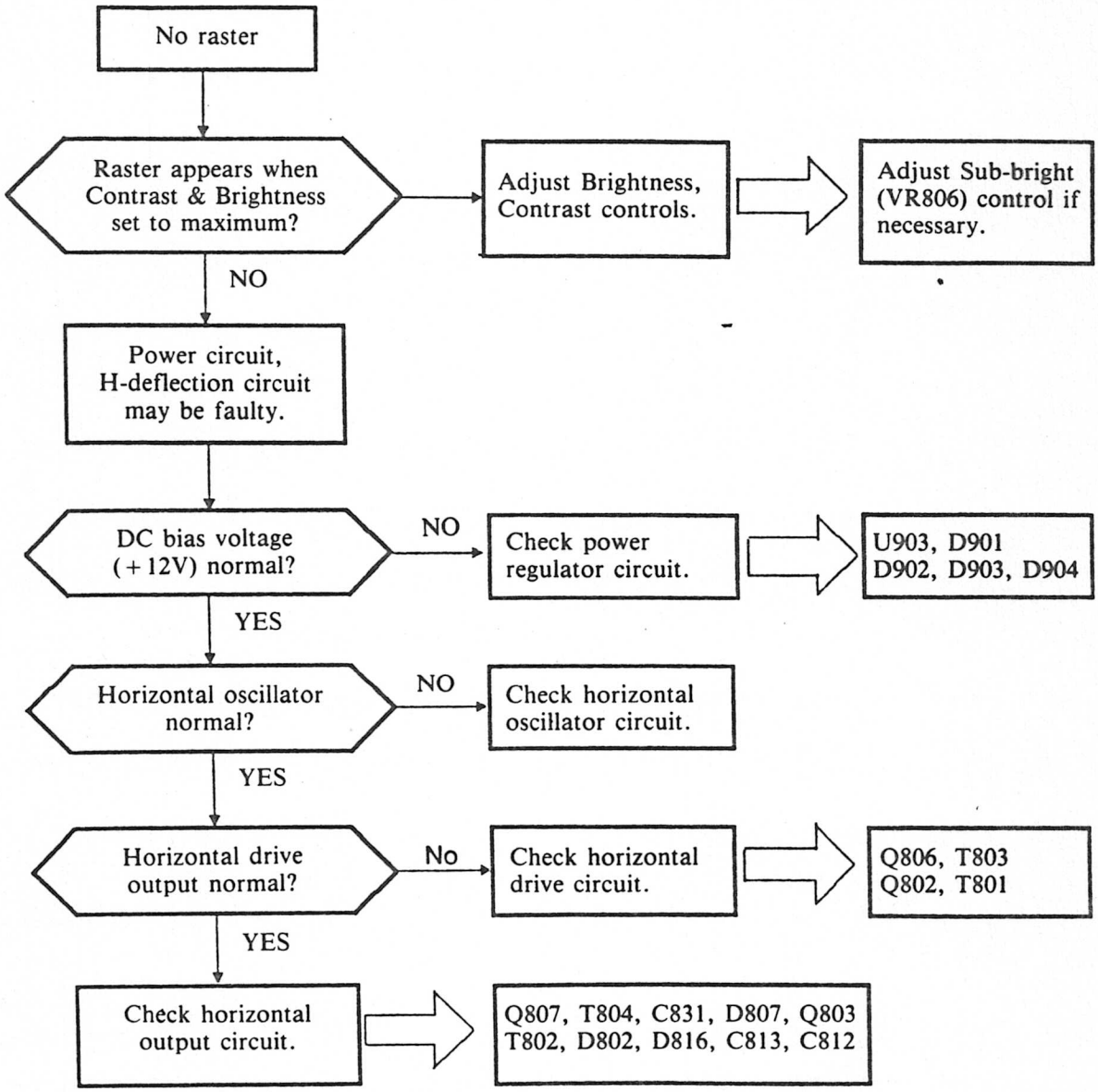
VERTICAL HEIGHT AND LINEARITY

Adjust the V-Linearity control (VR602) to obtain the best linearity. Adjust the V-Size control (VR603) to gain the most preferred picture.

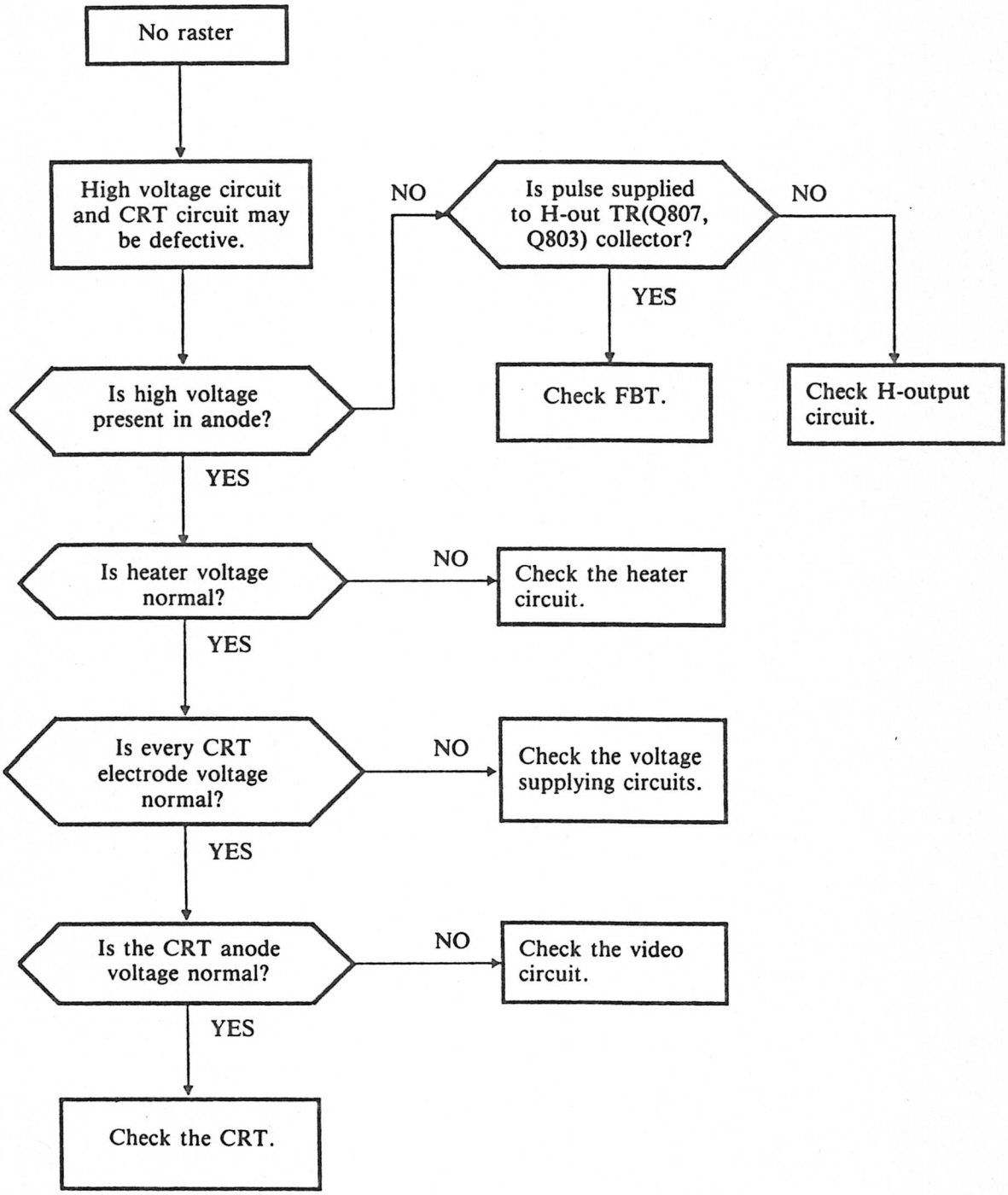
SUB-BRIGHT

Adjust the Brightness control (VR805) to maximum, then properly adjust the Sub-bright (VR806) until the background raster disappears.

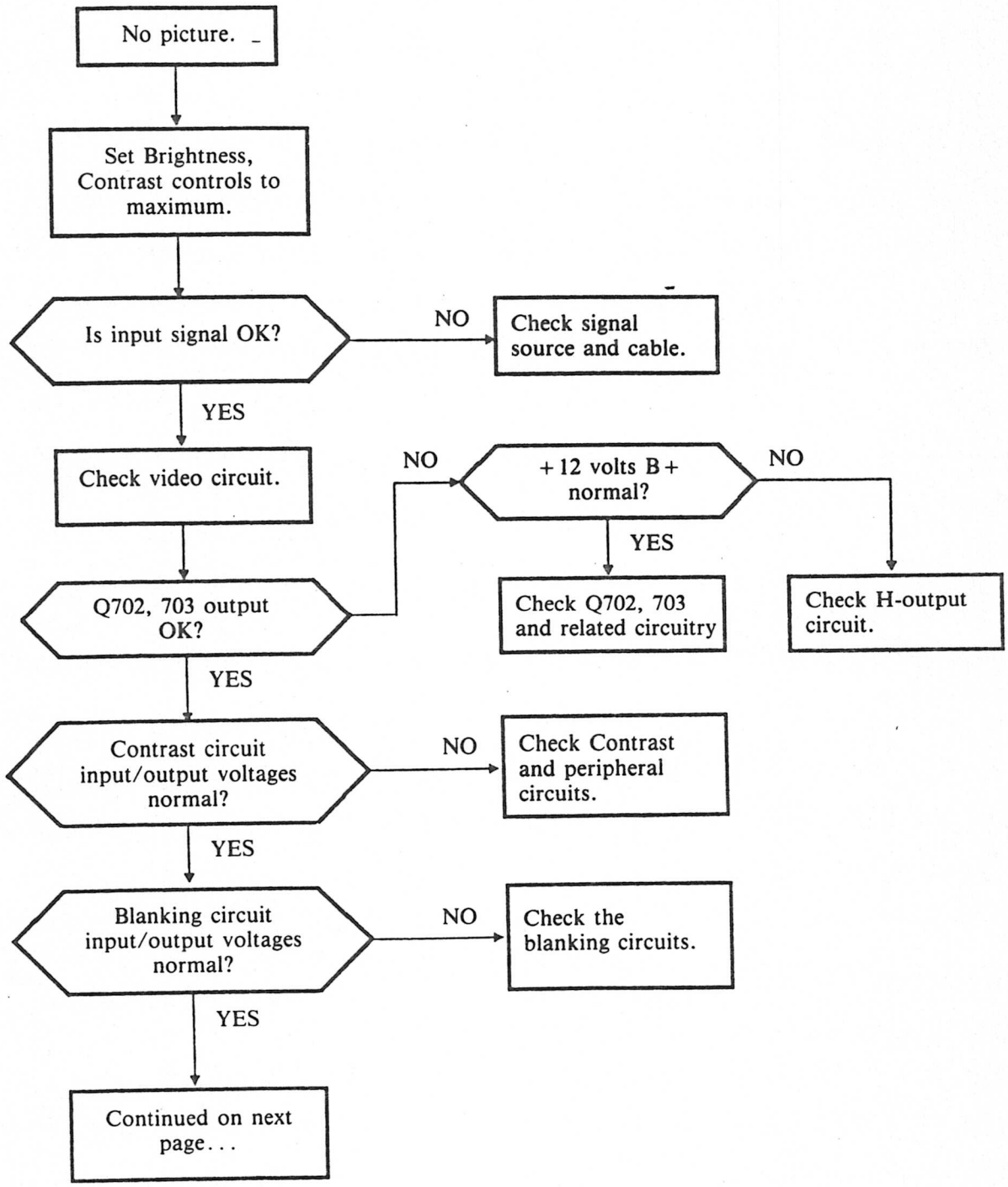
3.2 TROUBLESHOOTING FLOWCHARTS



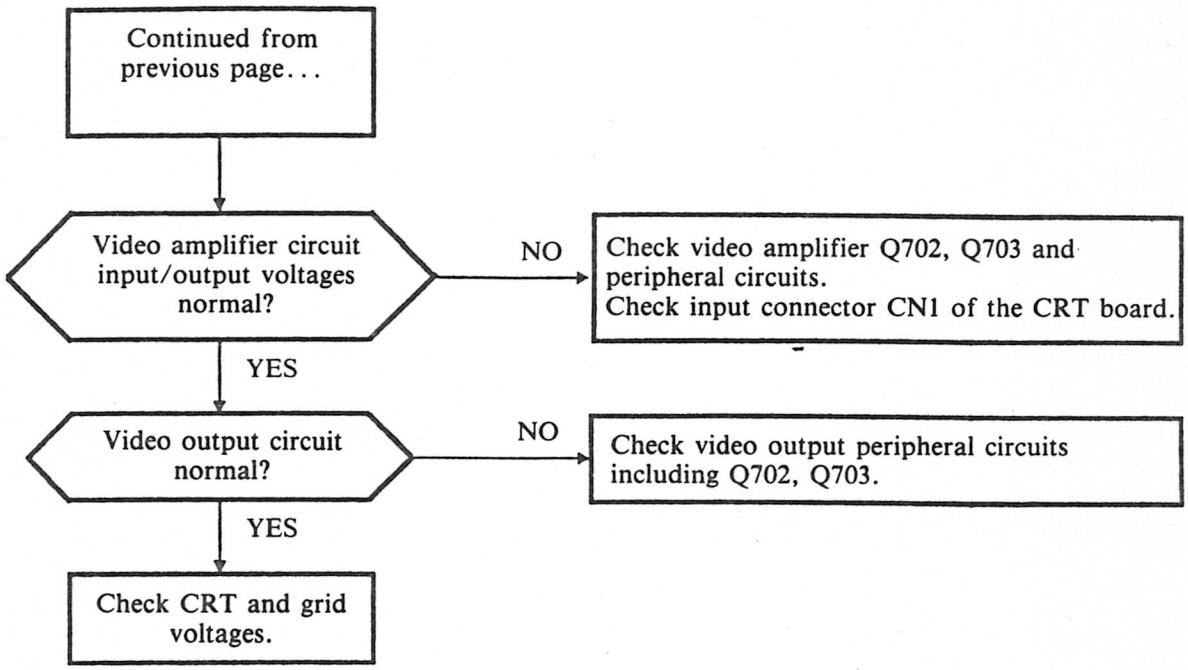
3.2 TROUBLESHOOTING FLOWCHARTS (Continued)

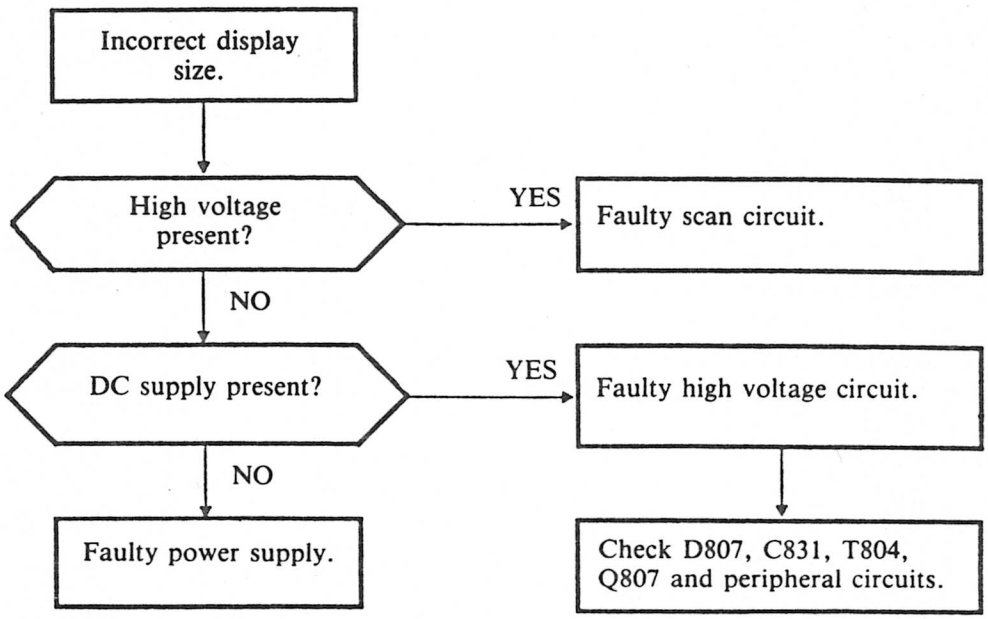


3.2 TROUBLESHOOTING FLOWCHARTS (Continued)

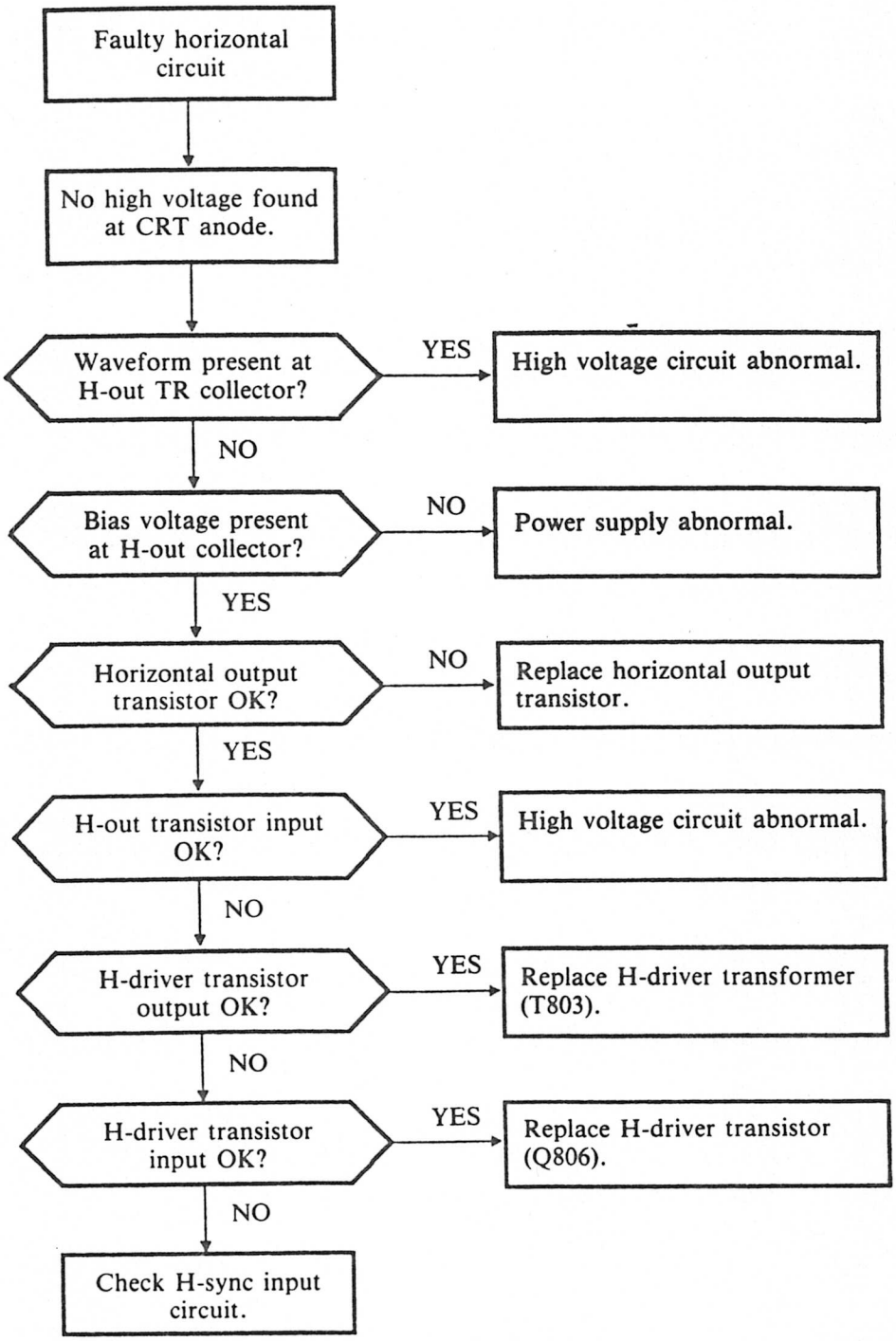


3.2 TROUBLESHOOTING FLOWCHARTS (Continued)


Continued from previous page...
Video amplifier circuit input/output voltages normal?
NO
Check video amplifier Q702, Q703 and peripheral circuits.
Check input connector CN1 of the CRT board.
YES
Video output circuit normal?
NO
Check video output peripheral circuits including Q702, Q703.
YES
Check CRT and grid voltages.



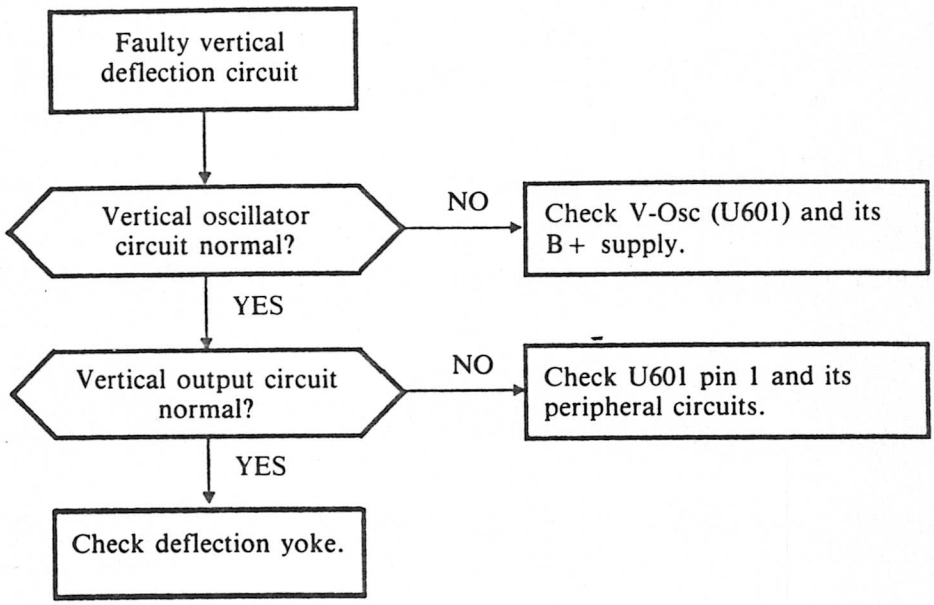
3.2 TROUBLESHOOTING FLOWCHARTS (Continued)



3.2 TROUBLESHOOTING FLOWCHARTS (Continued)

Trouble:

Only one horizontal line appears on screen. Picture displayed only on the upper or lower part of screen.



3.3 A2024 PHASE LOCKED LOOP TUNING PROCEDURE

EQUIPMENT NEEDED

Dual trace oscilloscope
5 volt power supply
A2024 Scan Converter PCB (unit under test)
A2000 computer (to generate video & clocks for testing).

PROCEDURE

Connect channel 1 of scope to PIN 6 of PLL. Trigger off of this channel.
(This is the A2000 3.58 Mhz clock.)

Connect channel 2 of scope to PIN 3 of PLL.
(This is PLL VCO 3.58 Mhz clock.)

Connect Pin 2 of PLL to GND.
(This disables the loop comparitor gain allowing the PLL VCO to free run.)

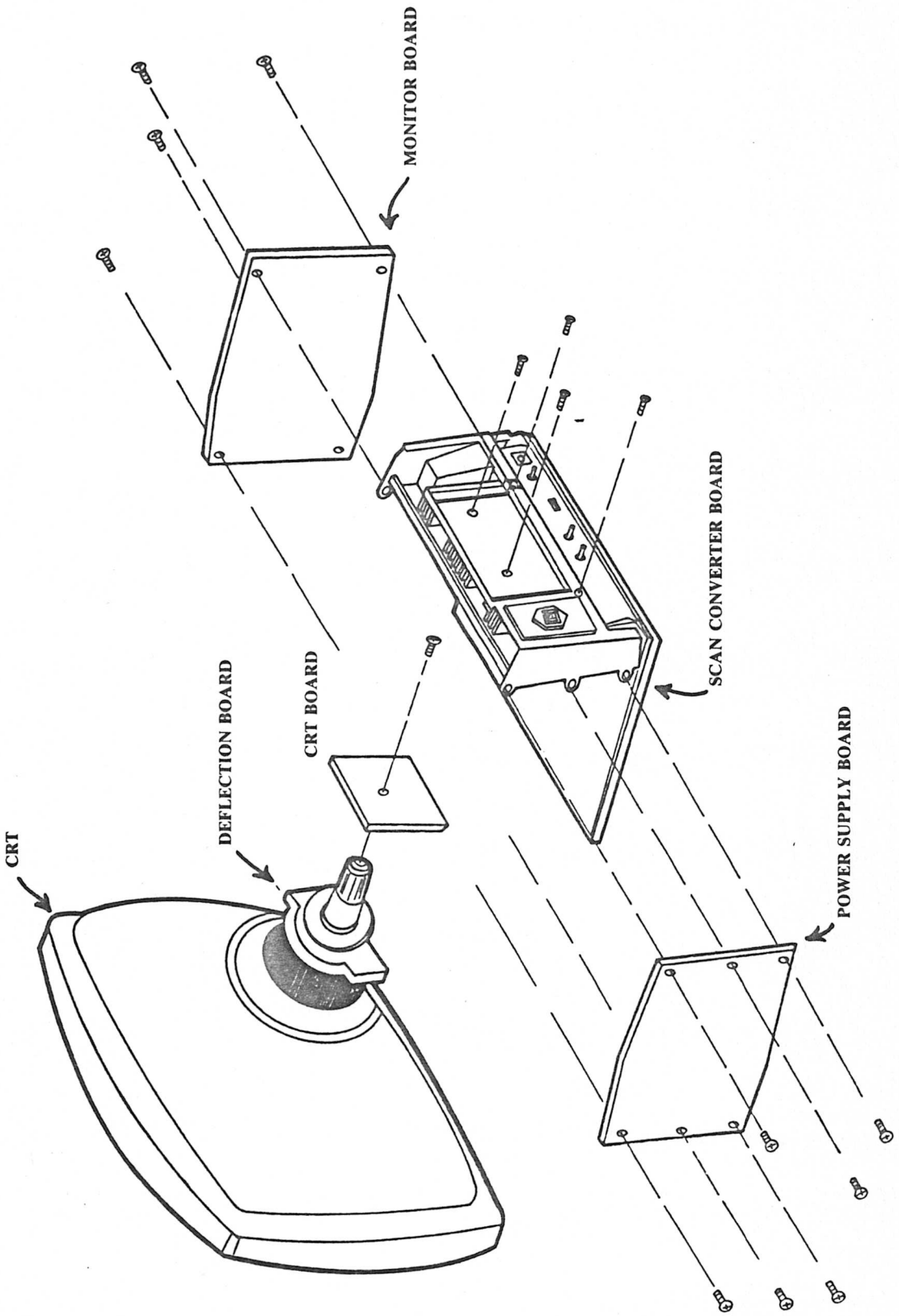
Apply power to system.

Adjust VC1 until the two waveforms on the scope appear to be stationary. Note you must remove adjustment tool to verify exact setting because VC1 is very sensitive to physical pressure.
(Due to coupling, it may be possible to actually achieve lock, but the goal is to get the two waveforms as synced as possible.)

Remove connection of PIN 2 on PLL to GND. The loop should now be firmly locked. Verify that observed waveforms on scope are stable.

SECTION 4

PARTS



EXPLODED VIEW

Commodore International Spare Parts List
PCB Components
PCB Assembly #A2024 — REV. 1.3

Commodore part numbers are provided for reference only and do not indicate the availability of spare parts from Commodore. Industry standard parts (Resistors, Capacitors, Connectors) should be secured locally. Part number information may vary according to country, some parts may not be available in all countries.

602290-01	"P"TITE T-SCREW, PTB M3X8 ZN-C	
602290-02	"P"TITE T-SCREW, PTB M4X10 ZN-	
602290-03	"P"TITE T-SCREW, PTB M4X12 NI	
602290-04	AC SOCKET, BLACK	
602290-05	BAG, P.E.	
602290-06	BAG, P.E.	
602290-07	BAG, P.E.	
602290-08	BARE WIRE, 0.6	
602290-09	BASE, 15P	CN1
602290-10	BASE, 2P	B908
602290-11	BASE, 2P	K602,801
602290-12	BASE, 2P	VYOKE
602290-13	BASE, 2P	
602290-14	BASE, 2P	B902,903
602290-15	BASE, 2P	CN3
602290-16	BASE, 3P	K701,805
602290-17	BASE, 3P	H.YOKE,K803,804
602290-18	BASE, 3P	
602290-19	BASE, 3P	
602290-20	BASE, 4P	K702
602290-21	BASE, 4P	B905
602290-22	BASE, 9P	CN2
602290-23	BEZEL	
602290-24	BKT, BASE	
602290-25	BKT, CONVERTER	
602290-26	BKT, CRT, L	
602290-27	BKT, REAR	
602290-28	BKT, REAR "L"	
602290-29	BKT, REAR, UPPER	
602290-30	BOTTOM, PEDESTAL	
602290-31	BRACKET, CRT, R	
602290-32	BRACKET, HEAT SINK	
602290-33	BRACKET, LEFT	
602290-34	BRACKET, LEFT	
602290-35	BRACKET, MID RIGHT	
602290-36	BRACKET, REAR, RIGHT	
602290-37	BRACKET, RIGHT	
602290-38	BRACKET, TOP LEFT, MONITOR	
602290-39	BRACKET, TOP RIGHT	
602290-40	BUSHING	
602290-41	BUSHING, TO-220	Q803,807,809,903
602290-42	BUSHING, TO-3, AD-447	
602290-43	BUSHING, TO-3E, AD-427	
602290-44	BUSHING, TO-3P	Q901
602290-45	BUSHION, MOVABLE	
602290-46	CABLE WIRE ASSY, 10P	
602290-47	CABLE WIRE ASSY, 14P	
602290-48	CAP. CERAMIC, B K, 0.01UF 1KV	C820,826,827
602290-49	CAP. CERAMIC, B K, 0.01UF 50V	C926,934
602290-50	CAP. CERAMIC, B K, 0.01UF 500V	C832
602290-51	CAP. CERAMIC, B K, 100P 50V	
602290-52	CAP. CERAMIC, B K, 1000P 50V	C935
602290-53	CAP. CERAMIC, B K, 120P 1KV	C842
602290-54	CAP. CERAMIC, B K, 470P 2KV	C814
602290-55	CAP. CERAMIC, B K, 6800P 50V	C834
602290-56	CAP. CERAMIC, B M, 100PF 100V	E1-7
602290-57	CAP. CERAMIC, CH J, 10P 50V	C20
602290-58	CAP. CERAMIC, CH J, 47P 50V	
602290-59	CAP. CERAMIC, CH J, 68P 50V	C713
602290-60	CAP. CERAMIC, F Z, 0.01UF 50V	C707,710,712,810,830
602290-61	CAP. CERAMIC, F Z, 2200P 50V	C818,828
602290-62	CAP. CERAMIC, SL J, 68P 50V	C844
602290-63	CAP. CERAMIC, 4700PF 400V, U/C	C929,933
602290-64	CAP. ELECT CEL-S, 330UF 250V	C908,909
602290-65	CAP. ELECT 105C, 470UF 160V	C914
602290-66	CAP. ELECT-S 105C, 1UF 50V	
602290-67	CAP. ELECT-S 105C, 10UF 50V	
602290-68	CAP. ELECT-S 105C, 1000UF 16V	
602290-69	CAP. ELECT-S 105C, 220UF 25V	
602290-70	CAP. ELECT-S 105C, 470UF 16V	
602290-71	CAP. ELECT-S 105C, 470UF 25V	
602290-72	CAP. ELECT-S, 1.0UF 160V	
602290-73	CAP. ELECT-S, 1.0UF 50V	
602290-74	CAP. ELECT-S, 10UF 100V	
602290-75	CAP. ELECT-S, 100UF 100V	
602290-76	CAP. ELECT-S, 100UF 200V	
602290-77	CAP. ELECT-S, 100UF 25V	
602290-78	CAP. ELECT-S, 1000UF 10V	
602290-79	CAP. ELECT-S, 22UF 50V	
602290-80	CAP. ELECT-S, 220UF 25V	
602290-81	CAP. ELECT-S, 220UF 35V	
602290-82	CAP. ELECT-S, 2200UF 35V	
602290-83	CAP. ELECT-S, 33UF 25V	
602290-84	CAP. ELECT-S, 330UF 25V	
602290-85	CAP. ELECT-S, 330UF 50V	
602290-86	CAP. ELECT-S, 4.7UF 50V	
602290-87	CAP. ELECT, NP, 1UF 16V	C912
602290-88	CAP. ELECT, NP, 1UF 50V	C630
602290-89	CAP. ELECT, 100UF 200V	
602290-90	CAP. ELECT, 1000UF 25V	C917
602290-91	CAP. ELECT, 1000UF 35V	C606
602290-92	CAP. ELECT, 22UF 160V	
602290-93	CAP. ELECT, 220UF 160V	C915
602290-94	CAP. ELECT, 2200UF 16V	C920
602290-95	CAP. MEF(AC), 0.47UF 250V, UL+	C901,906
602290-96	CAP. MONO-KAP, NPO J, 0.01UF 5	C8,9,12,16,17
602290-97	CAP. MONO-KAP, NPO J, 100P 50V	C11,18,EM113
602290-98	CAP. MONO-KAP, X7R K, 0.01UF 5	
602290-99	CAP. MONO-KAP, Z5U M, 0.1UF 50	C1-7,13-15,10
602291-00	CAP. MONO-KAP, Z5U M, 0.33UF 50V	C90-97
602291-01	CAP. MONO-SPIN, NPO J, 1500P 5	C804
602291-02	CAP. MPP, J, 0.01UF 100V	
602291-03	CAP. MPP, J, 0.022UF 100V	
602291-04	CAP. MPP, J, 0.1UF 100V	
602291-05	CAP. MPP, J, 0.22UF 100V	
602291-06	CAP. MPP, K, 0.01UF 100V	
602291-07	CAP. MPP, K, 0.022UF 100V	
602291-08	CAP. MPP, K, 0.1UF 100V	
602291-09	CAP. MPP, K, 0.22UF 100V	
602291-10	CAP. PAPER, 0.0047UF 250VPME27	C904,905
602291-11	CAP. PEI, J, 0.1UF 50V	C601,603,612,609,704
602291-12	CAP. PEI, J, 0.15UF 50V	C604
602291-13	CAP. PEI, K, 0.22UF 100V	C607
602291-14	CAP. PEN, J, 0.022UF 50V	C936
602291-15	CAP. PEN, J, 0.22UF 50V	C602
602291-16	CAP. PEN, PEN, J, 0.47UF 50V	C910
602291-17	CAP. PPN, J, 0.001UF 1KV	C911
602291-18	CAP. PPN, J, 0.0015UF 2KV	C831
602291-19	CAP. PPN, J, 0.0027UF 2KV	
602291-20	CAP. PPN, J, 0.01UF 1.6KV	
602291-21	CAP. PPN, J, 0.1UF 250V	C813
602291-22	CAP. PPN, J, 0.22UF 250V	
602291-23	CAP. TAN, K, 10UF 16V	
602291-24	CAP. TAN, K, 10UF 25V	
602291-25	CAP. TAN, K, 4.7UF 25V	
602291-26	CAP. TRIMMER, 30PF	VC1
602291-27	CARTON (COMMODORE)	
602291-28	CHE-LIQ, SOLVENT	
602291-29	CHE-LIQ, THINNER	
602291-30	CHE-LIQ, THINNER	
602291-31	CHEMICAL, FLUX	
602291-32	CHEMICAL, FLUX	
602291-33	CHEMICAL, SONY BOND SC608	
602291-34	CHOKE	L903
602291-35	CHOKE	L904
602291-36	CHOKE	L906
602291-37	CHOKE, LINE FILTER, 11.5MH9	L901,902
602291-38	CHOKE, 13UH	L801
602291-39	CLAMP, CABLE	
602291-40	CON. ASSY, 2P	
602291-41	CON. ASSY, 3P	
602291-42	CON. ASSY, 3P	

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PCB Components *(Continued)*
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602291-43	CON. ASSY, 3P	
602291-44	CON. ASSY, 3P	
602291-45	CON. ASSY, 3P	
602291-46	CON. ASSY, 3P	
602291-47	CON. ASSY, 4P	
602291-48	CORD, AC PWR, C+NS	
602291-49	CORD, AC PWR, C+NS	
602291-50	CORD, AC PWR, C+NS	
602291-51	CORD, AC PWR, C+S	
602291-52	CORE	EMI1-7
602291-53	CORE	
602291-54	CORE	
602291-55	CORE	CN1
602291-56	CORE	
602291-57	COVER, BASE	
602291-58	COVER, SHIELD	
602291-59	CPU LABEL	
602291-60	CRT SOCKET, 8P	
602291-61	CRT, 15" P/W, 898HGDBRS CE898M15H192VRZ (SUB)	
602291-62	CRYSTAL OSC. 49.5MHZ	U4
602291-63	CRYSTAL OSC. 72.000MHZ	U3
602291-64	CRYSTAL, 28.6363MHZ	Y1
602291-65	CUSHION, BASE	
602291-66	CUSHION, CAP	
602291-67	DIODE, REC. 1.5A 1KV, GP15M	D901-904
602291-68	DIODE, REC. 1A 100V, RGP10B	D905,906,913,914
602291-69	DIODE, REC. 1A 1000V, UF4007	
602291-70	DIODE, REC. 1A 1000V, UF4007	D803,815
602291-71	DIODE, REC. 1A 400V, RGP10G-PK	D602,607,801,702
602291-72	DIODE, REC. 1A 600V, UF4005	D806
602291-73	DIODE, REC. 1A 800V, RGP10K-PK	D907
602291-74	DIODE, REC. 2A 200V, RGP20D	D909
602291-75	DIODE, REC. 3A 1KV, RG3M	D807
602291-76	DIODE, REC. 3A 60V, SB360	D911
602291-77	DIODE, REC. 3A 600V, RGP30J	D908
602291-78	DIODE, REC. 4A 1000V, MUR4100	D804,805
602291-79	DIODE, S-SIGNAL, 1N4148	D601,603,605
602291-80	DIODE, S-SIGNAL, 1N4148	D1-4
602291-81	FUSE, SLOW BLOW, 2A 250V	
602291-82	GATE ARRAY	
602291-83	GUIDE, USER'S (COMMODORE)	
602291-84	H.S. TUBE, 5.0X0.25, BLACK	
602291-85	H.V.T.	T804
602291-86	H-NUT, M3-ZN-CC	
602291-87	HEAT SINK	Q809
602291-88	HEAT SINK	
602291-89	HEAT SINK	U601
602291-90	HEAT SINK	
602291-91	HEAT SINK	
602291-92	HEAT SINK	
602291-93	HEAT SINK	Q901
602291-94	HEAT SINK	U903
602291-95	HEXAGON NUT, M3 NI	
602291-96	HEXAGON NUT, M4 ZN-CC	
602291-97	IC CMOS, 74HC74	
602291-98	IC DRAM, 64KX4, UPD41264-12	
602291-99	IC DRAM, 64KX4, UPD41264-15	U90-97
902292-00	IC LINEAR, MC1723CP	U904
902292-01	IC LINEAR, NE564	U2
902292-02	IC LINEAR, TDA1675	U601
902292-03	IC LINEAR, TDA2595	U801
902292-04	IC LINEAR, 431	U901
902292-05	IC LINEAR, 741	U802
902292-06	IC OPTO-COUPLER, CQY80NG	U902
902292-07	IC SOCKET PLCC, 84P	U1
902292-08	IC SOCKET, 14P	U5
902292-09	IC TTL, 74ALS74	U905
902292-10	IC TTL, 74S00	U5
902292-11	ID LABEL (COMMODORE)	
902292-12	JACK, RCA	CN2,5
902292-13	JUMP WIRE	J1-17,28,901-919
902292-14	KNOB	
902292-15	L.O.T.	T802
902292-16	LABEL	
902292-17	LABEL	
902292-18	LABEL	
902292-19	LABEL, LOCATION	
902292-20	LABEL, LOGO (COMMODORE)	
902292-21	LABEL, TEST OK	
902292-22	LABEL, WARNING	
902292-23	LABEL, WARNING	
902292-24	LABEL, WARNING A	
902292-25	LABEL, WARNING B	
902292-26	LED, RED, 2.0X7.0	
902292-27	LINER COIL, 1-224-015	
902292-28	M-SCREW, CBS M2X3, ZN-CC	
902292-29	M-SCREW, CBS M3X10, ZN-CC	
902292-30	M-SCREW, CBS M3X12, ZN-CC	
902292-31	M-SCREW, CBS M3X16, ZN-CC	
902292-32	M-SCREW, CBS M3X6, ZN-CC	
902292-33	M-SCREW, CBS M3X8, ZN-CC	
902292-34	M-SCREW, CFS M3X16 NI	
902292-35	M-SCREW, CPS M3X8, ZN-CC	
902292-36	M-SCREW, CPS M4X12, NI	
902292-37	M-SCREW, CPS M4X8, ZN-CC	
902292-38	M-SCREW, M4X12, NI	
902292-39	MESH, SAFETY	
902292-40	MESH, SAFETY	
902292-41	MICA INSULATOR, TO-218/SOT-93	Q803,807
902292-42	MOS FET, 2SK511	Q702
902292-43	P.C.B. CRT	
902292-44	P.C.B. LED, 1-304-276	
902292-45	P.C.B. MONITOR	
902292-46	P.C.B. POWER	
902292-47	P.C.B. SCAN CONVERTER	
902292-48	P.C.B. VR, 1-304-275	
902292-49	P.V.C. TUBE, 8.2@, TRANSPARENT	
902292-50	PAD, FOOT	
902292-51	PANEL, REAR	
902292-52	PEAKING COIL, 1.0UH K	L701
902292-53	PEAKING COIL, 3.3UH J	L1
902292-54	PEAKING COIL, 3.3UH K	
902292-55	PIN, C, 0.97@	
902292-56	PIN, GT, 2.36@	
902292-57	PLATE, HOLDER	
902292-58	PLATE, MOUNTING, UPPER	
902292-59	PLATE, POWER	
902292-60	PLATE, PRESSURE	
902292-61	PLATE, SERIAL NO.	
902292-62	PLATE, SPRING	
902292-63	POWER REGULATOR, L7812CV	U903
902292-64	PRODUCT FLOW TAG	
902292-65	PRODUCT FLOW TAG	
902292-66	RES. CARBON-S, ¼W, 1.0K OHM	
902292-67	RES. CARBON-S, ¼W, 1.5K OHM	
902292-68	RES. CARBON-S, ¼W, 10K OHM J	
902292-69	RES. CARBON-S, ¼W, 100K OHM	
902292-70	RES. CARBON-S, ¼W, 120 OHM J	
902292-71	RES. CARBON-S, ¼W, 120K OHM	
902292-72	RES. CARBON-S, ¼W, 15K OHM J	
902292-73	RES. CARBON-S, ¼W, 18K OHM J	
902292-74	RES. CARBON-S, ¼W, 2.2 OHM J	
902292-75	RES. CARBON-S, ¼W, 2.2K OHM	
902292-76	RES. CARBON-S, ¼W, 2.4K OHM	
902292-77	RES. CARBON-S, ¼W, 2.7K OHM	
902292-78	RES. CARBON-S, ¼W, 27K OHM J	
902292-79	RES. CARBON-S, ¼W, 270 OHM J	
902292-80	RES. CARBON-S, ¼W, 3.9K OHM	
902292-81	RES. CARBON-S, ¼W, 33 OHM J	
902292-82	RES. CARBON-S, ¼W, 330 OHM J	
902292-83	RES. CARBON-S, ¼W, 39K OHM J	
902292-84	RES. CARBON-S, ¼W, 4.7K OHM	
902292-85	RES. CARBON-S, ¼W, 47 OHM J	
902292-86	RES. CARBON-S, ¼W, 47K OHM J	
902292-87	RES. CARBON-S, ¼W, 5.6K OHM	
902292-88	RES. CARBON-S, ¼W, 56K OHM J	
902292-89	RES. CARBON-S, ¼W, 6.8K OHM	
902292-90	RES. CARBON-S, ¼W, 680 OHM J	
902292-91	RES. CARBON-S, ¼W, 75 OHM J	

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902292-92	RES. CARBON-S, ¼W, 82K OHM J	
902292-93	RES. CARBON-S, ¼W, 820 OHM J	
902292-94	RES. CARBON-S, ¼W, 820K OHM	
902292-95	RES. CARBON, ½W, 390K J	R906,905
902292-96	RES. CARBON, ½W, 470 OHM J	R917
902292-97	RES. CARBON, ¼W, 1.8K J	R924
902292-98	RES. CARBON, ¼W, 1K J	R922
902292-99	RES. CARBON, ¼W, 1M J	R901
902293-00	RES. CARBON, ¼W, 10K J	R13-15,23,24,925
902293-01	RES. CARBON, ¼W, 100 OHM J	R1-6,929
902293-02	RES. CARBON, ¼W, 100K J	R8,22
902293-03	RES. CARBON, ¼W, 130 OHM J	R21.
902293-04	RES. CARBON, ¼W, 18K J	R920
902293-05	RES. CARBON, ¼W, 180 OHM J	R25
902293-06	RES. CARBON, ¼W, 2.2K J	R915
902293-07	RES. CARBON, ¼W, 200 OHM J	R20
902293-08	RES. CARBON, ¼W, 220K J	R916
902293-09	RES. CARBON, ¼W, 3.9K J	R921
902293-10	RES. CARBON, ¼W, 330 OHM J	R912
902293-11	RES. CARBON, ¼W, 4.7K J	R926
902293-12	RES. CARBON, ¼W, 47 OHM J	R30,31
902293-13	RES. CARBON, ¼W, 470 OHM J	R9-12
902293-14	RES. CARBON, ¼W, 680 OHM J	
902293-15	RES. CARBON, ¼W, 82K J	R914
902293-16	RES. M-OXIDE-S, 1W, 1.2 OHM J	R819
902293-17	RES. M-OXIDE-S, ½W, 1 OHM J	R827*
902293-18	RES. M-OXIDE-S, 1W, 470 OHM J	
902293-19	RES. M-OXIDE-S, 2W, 1 OHM J	R826,842
902293-20	RES. M-OXIDE-S, 2W, 10K J	R844,850
902293-21	RES. M-OXIDE-S, 2W, 100K J	R831,832
902293-22	RES. M-OXIDE-S, 2W, 18 OHM J	R818,838
902293-23	RES. M-OXIDE-S, 2W, 270 OHM J	R611
902293-24	RES. M-OXIDE-S, 2W, 5.6K J	R843
902293-25	RES. M-OXIDE-S, 3W, 0.91 OHM J	
902293-26	RES. M-OXIDE-S, 3W, 22 OHM J	
902293-27	RES. M-OXIDE-S, 5W, 150 OHM J	R711
902293-28	RES. M-OXIDE-S, 5W, 220 OHM J	
902293-29	RES. M-OXIDE, 1W, 100K J	R903,904
902293-30	RES. M-OXIDE, 1W, 47K J	R913
902293-31	RES. M-OXIDE, 1W, 560 OHM J	R708
902293-32	RES. M-OXIDE, 2W, 1.5 OHM J	R608
902293-33	RES. METAL-P, ¼W, 2.15K F	R928
902293-34	RES. METAL-P, ¼W, 4.99K F	R927
902293-35	RES. METAL-S, ½W, 1M J	R830
902293-36	RES. METAL-S, ½W, 10 OHM J	R707,722,817
902293-37	RES. METAL-S, ½W, 12 OHM J	R715
902293-38	RES. METAL-S, ½W, 180K J	R829
902293-39	RES. METAL-S, ½W, 220 OHM J	R816,840
902293-40	RES. METAL-S, ½W, 220K J	R845
902293-41	RES. METAL-S, ½W, 3.3K J	R625
902293-42	RES. METAL-S, 1W, 3.9 OHM J	R841*
902293-43	RES. METAL-S, ½W, 330 OHM J	R822
902293-44	RES. METAL-S, ½W, 390 OHM J	R813
902293-45	RES. METAL-S, ½W, 47K J	R811
902293-46	RES. METAL-S, ½W, 470 OHM J	R821,833
902293-47	RES. METAL-S, ¼W, 1.5K J	R703
902293-48	RES. METAL-S, ¼W, 1K J	R607,628,804
902293-49	RES. METAL-S, ¼W, 10K J	R613,621,624
902293-50	RES. METAL-S, ¼W, 100K J	R616,619,807,837
902293-51	RES. METAL-S, ¼W, 120 OHM J	R609
902293-52	RES. METAL-S, ¼W, 120K J	R604,849
902293-53	RES. METAL-S, ¼W, 15K J	R705
902293-54	RES. METAL-S, ¼W, 18K J	
902293-55	RES. METAL-S, ¼W, 2.2 OHM J	R612
902293-56	RES. METAL-S, ¼W, 2.2K J	R847
902293-57	RES. METAL-S, ¼W, 2.4K J	R610
902293-58	RES. METAL-S, ¼W, 2.7K J	R814,823,835
902293-59	RES. METAL-S, ¼W, 27K J	R618
902293-60	RES. METAL-S, ¼W, 270 OHM J	R704
902293-61	RES. METAL-S, ¼W, 3.9K J	R617,836
902293-62	RES. METAL-S, ¼W, 33K J	R623
902293-63	RES. METAL-S, ¼W, 330 OHM J	R846
902293-64	RES. METAL-S, ¼W, 39K J	R620
902293-65	RES. METAL-S, ¼W, 4.7K J	R601,615,622
902293-66	RES. METAL-S, ¼W, 47 OHM J	R717,815,839
902293-67	RES. METAL-S, ¼W, 47K J	R812
902293-68	RES. METAL-S, ¼W, 5.6K J	R602,603,706
902293-69	RES. METAL-S, ¼W, 56K J	R606
902293-70	RES. METAL-S, ¼W, 6.8K J	R626
902293-71	RES. METAL-S, ¼W, 680 OHM J	R810
902293-72	RES. METAL-S, ¼W, 75 OHM J	R701,702
902293-73	RES. METAL-S, ¼W, 82K J	R806
902293-74	RES. METAL-S, ¼W, 820 OHM J	R632,808
902293-75	RES. METAL-S, ¼W, 820K J	R605,848
902293-76	RES. METAL, ¼W, 100 OHM J	R19
902293-77	RES. METAL, ¼W, 2.2K J	R16
902293-78	RES. METAL, ¼W, 6.8K OHM J	R17
902293-79	RES. SOLID, ½W, 2.2 OHM K	R825
902293-80	RES. SOLID, ½W, 2.2 OHM K	
902293-81	RES. SOLID, ½W, 47 OHM J	R820,824,851
902293-82	RES. SOLID, ½W, 47 OHM K	
902293-83	RES. SOLID, ½W, 47K J	R718,719
902293-84	RES. SOLID, ½W, 470 OHM J	R716
902293-85	RES. W-WOUND, 5W, 0.47 OHM J	R923
902293-86	RES. W-WOUND, 7W, 1 OHM J	R902
902293-87	RES. W-WOUND, 7W, 24 OHM J	R907,908
902293-88	RES. W-WOUND, 7W, 470 OHM J	R909,910
902293-89	RETAINER A	
902293-90	RETAINER B	
902293-91	RING, SEAT	
902293-92	RUBBER PAD, CRT	
902293-93	S.M.P. TRANS.	T902
902293-94	S.M.P. TRANS.	T901
902293-95	SCREW, CRT MOUNTING	
902293-96	SHEET, INSULATED	
902293-97	SHEET, INSULATION	
902293-98	SHEET, INSULATION	
902293-99	SHEET, INSULATION	
902294-00	SHIELD WIRE ASSY, 4P	K702
902294-01	SILICON RUBBER, TO-220	Q702,809,903,U903
902294-02	SILICON RUBBER, TO-3P	
902294-03	SILICON TUBE, 1.5@, WHITE	R818,826,831
902294-04	SILICON TUBE, 2.0@, WHITE	
902294-05	SL.VR. PCB.-C 1K, VJ2013PVN5B	VR701
902294-06	SL.VR. PCB.-C, 100K, VJ2013PVN	VR805
902294-07	SOLDER BAR, 63% 0.5KG	
902294-08	SOLDER WIRE, 1.0MM 60% 1KG	
902294-09	SOLDER WIRE, 1.2MM 60% 1KG	
902294-10	SPACER, SUPPORT	
902294-11	SPARK GAP, 1KV	SP1,3
902294-12	SPARK GAP, 350V	SP2,4
902294-13	SPRING, GROUND	
902294-14	SPRING, CLIP	
902294-15	SVR. H-M.-S, 100K, VG086TL3	VR806
902294-16	SVR. H-M.-S, 2K, VG086TL3	
902294-17	SVR. H-M.-S, 3K, VG086TL3	VR807
902294-18	SVR. H-M.-S, 30K, VG086TL3	VR802
902294-19	SVR. H-M.-S, 50K, VG086TL3	VR064,801
902294-20	SVR. V-C.-S, 100K	VR602
902294-21	SVR. V-M.-S, 10K, VG086TL3	VR901
902294-22	SVR. V-M.-S, 2M, VG152H10S	VR804
902294-23	SW. SEESAW, D.P.S.T.	
902294-24	SW. SLIDE, S.P.D.T	SWI1
902294-25	T-SCREW, CBTA "A" M3.5X8 NI	
902294-26	TAPE, BLACK	
902294-27	TAPE, CREPE, 5MM	
902294-28	TAPE, FABRIC, 10MM	
902294-29	TAPE, KRAFT, 6MM	
902294-30	THERMISTOR, 12, 10SP012L	NTC901
902294-31	TIE, PLASTIC, UL 180MM	CN1
902294-32	TIE, PLASTIC, UL 90MM	
902294-33	TOOTHED LOCK WASHER, 3 ZN-CC	
902294-34	TOOTHED LOCK WASHER, 4 ZN-CC	
902294-35	TOP, HOUSING	
902294-36	TR. POWER, BD139	Q802,805,806
902294-37	TR. POWER, BD437	Q903
902294-38	TR. POWER, BUW12A	Q807
902294-39	TR. POWER, MJE13007A	Q804
902294-40	TR. POWER, SGSF444	
902294-41	TR. POWER, SGSF464	Q803

*INDICATES VENDOR ECN CHANGES

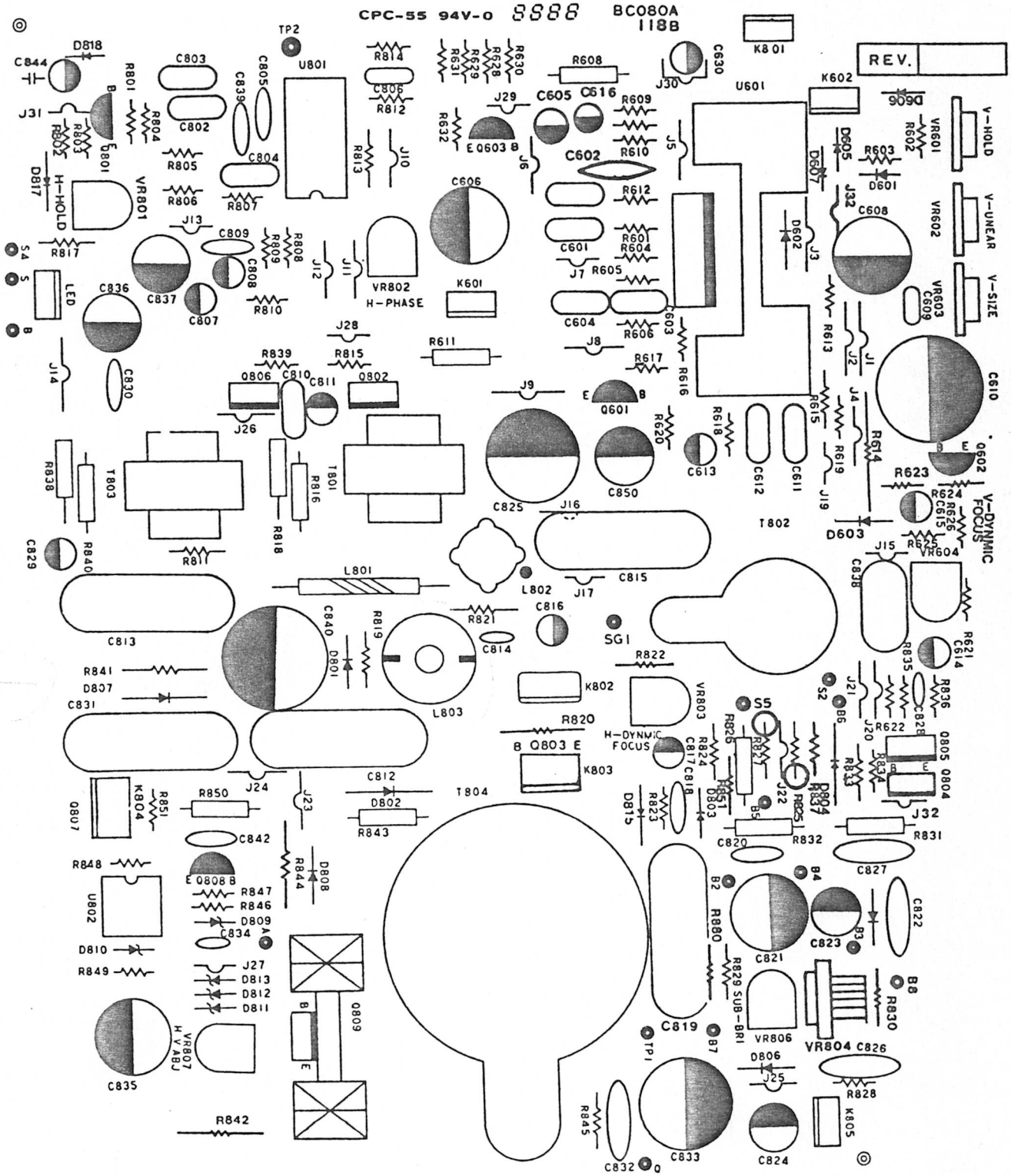
Commodore International Spare Parts List
PCB Components *(Continued)*
PCB Assembly #A2024 — REV. 1.3

902294-42	TR. POWER, TIP122	Q809	902294-91	CAP ELECT 100UF 25V	C709
902294-43	TR. POWER, 2SC1226AR	Q902	902294-92	CAP ELECT 100UF 25V	C837
902294-44	TR. POWER, 2SC3652	Q703	902294-93	CAP ELECT 10UF 100V	C811,823,829*
902294-45	TR. S-SIGNAL, 2SA1015Y	Q603	902294-94	CAP ELECT 10UF 16V	C927
902294-46	TR. S-SIGNAL, 2SC1213AC		902294-95	CAP ELECT 10UF 25V	C605
902294-47	TR. S-SIGNAL, 2SC1815GR	Q904	902294-96	CAP ELECT 1UF 160V	C816*
902294-48	TR. S-SIGNAL, 2SC22290	Q808	902294-97	CAP ELECT 1UF 50V	C614,817
902294-49	TR. S-SIGNAL, 2SD655E	Q701	902294-98	CAP ELECT 1UF 50V	C928
902294-50	TRANS. HOR. DRIVER	T801,803	902294-99	CAP ELECT 2200UF 35V	C610
902294-51	UNIT, FLOPPY DISK, A2024 P/N 3		902295-01	CAP ELECT 220UF 25V	C835,836
902294-52	VR. PCB. TYPE, 1K, VE12CV1 22.	VR1	902295-02	CAP ELECT 220UF 25V	C913,919
902294-53	VR. PCB. TYPE, 10K, VE12CV1 22		902295-03	CAP ELECT 220UF 35V	C608
902294-54	WEAVING VOLUME, 0.12/48		902295-04	CAP ELECT 22UF 160V	C824
902294-55	WEAVING WIRE ASSY, 1P		902295-05	CAP ELECT 22UF 35V	C615
902294-56	WEAVING WIRE ASSY, 1P		902295-06	CAP ELECT 330UF 25V	C705
902294-57	WIDTH COIL	L803	902295-07	CAP ELECT 330UF 50V	C821
902294-58	WIRE ASSY, 1P		902295-08	CAP ELECT 33UF 25V	C703,711
902294-59	WIRE ASSY, 1P		902295-09	CAP ELECT 4.7UF 50V	C613,616,807,808
902294-60	WIRE ASSY, 1P		902295-10	CAP ELECT 470UF 16V	C922,937
902294-61	WIRE ASSY, 1P		902295-11	CAP ELECT 470UF 25V	C918
902294-62	WIRE ASSY, 1P		902295-12	CAP MEF (DC) 0.1UF 1KV	C819
902294-63	WIRE ASSY, 1P		902295-13	CAP PEI J .01UF 50V	C805,809,839
902294-64	WIRE, 1015AWG24, BLACK		902295-14	CAP PEI J 0.022UF 50V	C806
902294-65	WIRE, 1015AWG24, BLUE		902295-15	CAP PEI J 0.1UF 100V	C717
902294-66	WIRE, 1015AWG24, GRAY		902295-16	CAP PEI J 0.22UF 50V	C802,803
902294-67	WIRE, 1015AWG24, GREEN		902295-17	CAP PEI K 0.1UF 100V	C838
902294-68	WIRE, 1015AWG24, ORANGE		902295-18	CAP PPN J 0.0039UF 2KV	C812*
902294-69	WIRE, 1015AWG24, RED		902295-19	CAP PPN J 0.25UF 250V	C815
902294-70	WIRE, 1015AWG24, WHITE		902295-20	CORE	FB1-4
902294-71	WIRE, 1015AWG24, YELLOW		902295-21	DIODE REC 3A 1000V BYW96E	D802
902294-72	YOKE	(USE LY080A307S)*	902295-22	DIODE S SIGNAL 1N4148	D912
902294-73	ZENER DIODE, ½W 3.6V, BZX79C	D809,813	902295-23	HEAT SINK	Q803,807
902294-74	ZENER DIODE, ½W 3.6V, BZX79C		902295-24	HEAT SINK	Q702
902294-75	ZENER DIODE, ½W 5.1V, HZ5C2	ZD901	902295-25	HEAT SINK	Q903
902294-76	ZENER DIODE, ½W 5.1V, HZ5C2		902295-26	LINER COIL	L802
902294-77	ZENER DIODE, ½W 6.2V, BZX79B	D810,811,812	902295-27	PLATE SPRING	
902294-78	ZENER DIODE, ½W 6.2V, BZX79B		902295-28	RES EMTAL-S ¼W 68K J	R828
902294-79	ZENER DIODE, 1W 12V, BZX85-C12	D701	902295-29	RES M OXIDE S 3W 0.75 OHM J	R911
902294-80	ZENER DIODE, 1W 12V, BZX85-C12		902295-30	RES M-OXIDE-S 3W 27 OHM J	R614
902294-81	BASE 2P	B906	902295-31	RES M-OXIDE-S 5W 220 OHM J	R724
902294-82	BASE 2P	B907	902295-32	SILICON RUBBER TO 3P	Q901
902294-83	BASE 3P	B901	902295-33	SVR H-M,-S 1K VG086TL3	VR803
902294-84	BKT MTG UPPER		902295-34	TOOTHED LOCK WASHER 3 ZN CC	Q901,903,U903
902294-85	BKT REAR "L"		902295-35	TR POWER SGSF442	Q901
902294-86	BRACKET LEFT		902295-36	TR S SIGNAL 2SC945P	Q601,602
902294-87	CAP ELECT 1000UF 10V	C21	902295-37	CAP CER 0.01UF 100V	C822*
902294-88	CAP ELECT 1000UF 16V	C921	902295-38	CAP CER 0.01UF 2KV	C826*
902294-89	CAP ELECT 100UF 100V	C708	902295-39	DIODE 4A 1000V MUR4100 UF4007*1	D805*
902294-90	CAP ELECT 100UF 200V	C825,833,840	902295-40	CAP CER 0.01UF 2KV	C718*

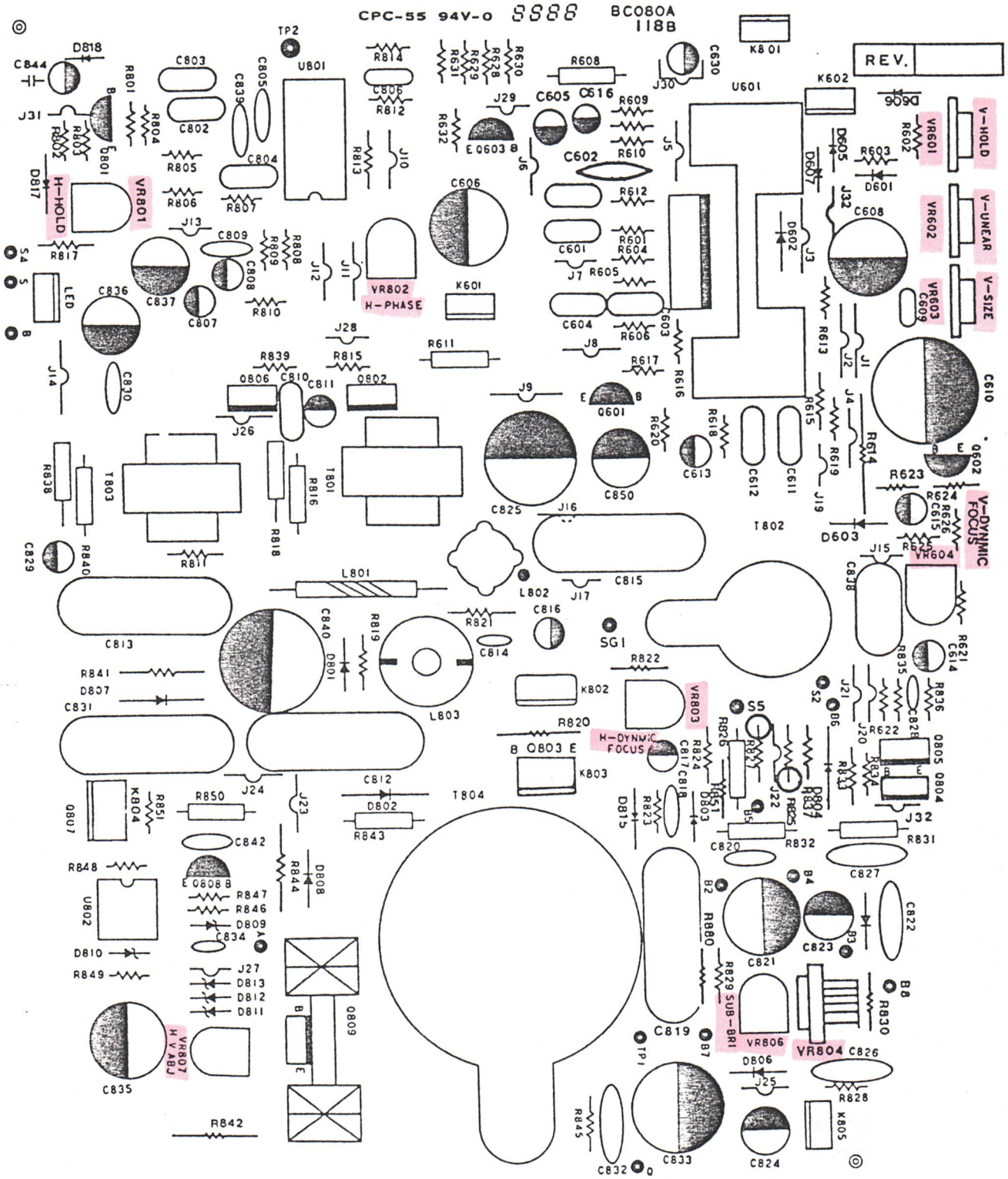
*INDICATES VENDOR ECN CHANGES

Shipping Assembly
CRT, Monochrome Monitor A2024

	COMMODORE PART NUMBER				
SHIPPING ASSEMBLY	311868-01 UL	311868-02 VDE	311868-03 SAA	311868-04 BSI	311868-05 CSA
MONITOR	312456-01	312456-02	312456-03	312456-02	312456-01
BOX	363150-01	363150-01	363150-01	363150-01	363150-01
BOX ART WORK	363149-01	363149-01	363149-01	363149-01	363149-01
LABEL, RATING	316509-01	316509-02	316509-02	316509-02	316509-01
LABEL BOX	316655-01	316657-01	316658-01	316659-01	316660-01
LABEL, UPC	316653-01	NA	NA	NA	316653-01
CABLE, POWER	903508-15	903508-01	903508-02	903508-16	903508-15
WARRANTY CARD	318290-01	NA	368014-01	NA	318882-01
USER'S MANUAL	368123-01	368123-01	368123-01	368123-01	368123-01
SOFTWARE LICENSE AGREEMENT	318896-01	NA	318896-01	NA	318896-01
DISK EXCHANGE CARD	312341-02	NA	NA	NA	318556-02
SOFTWARE DISK ASSEMBLY	317809-01	317809-01	317809-01	317809-01	317809-01



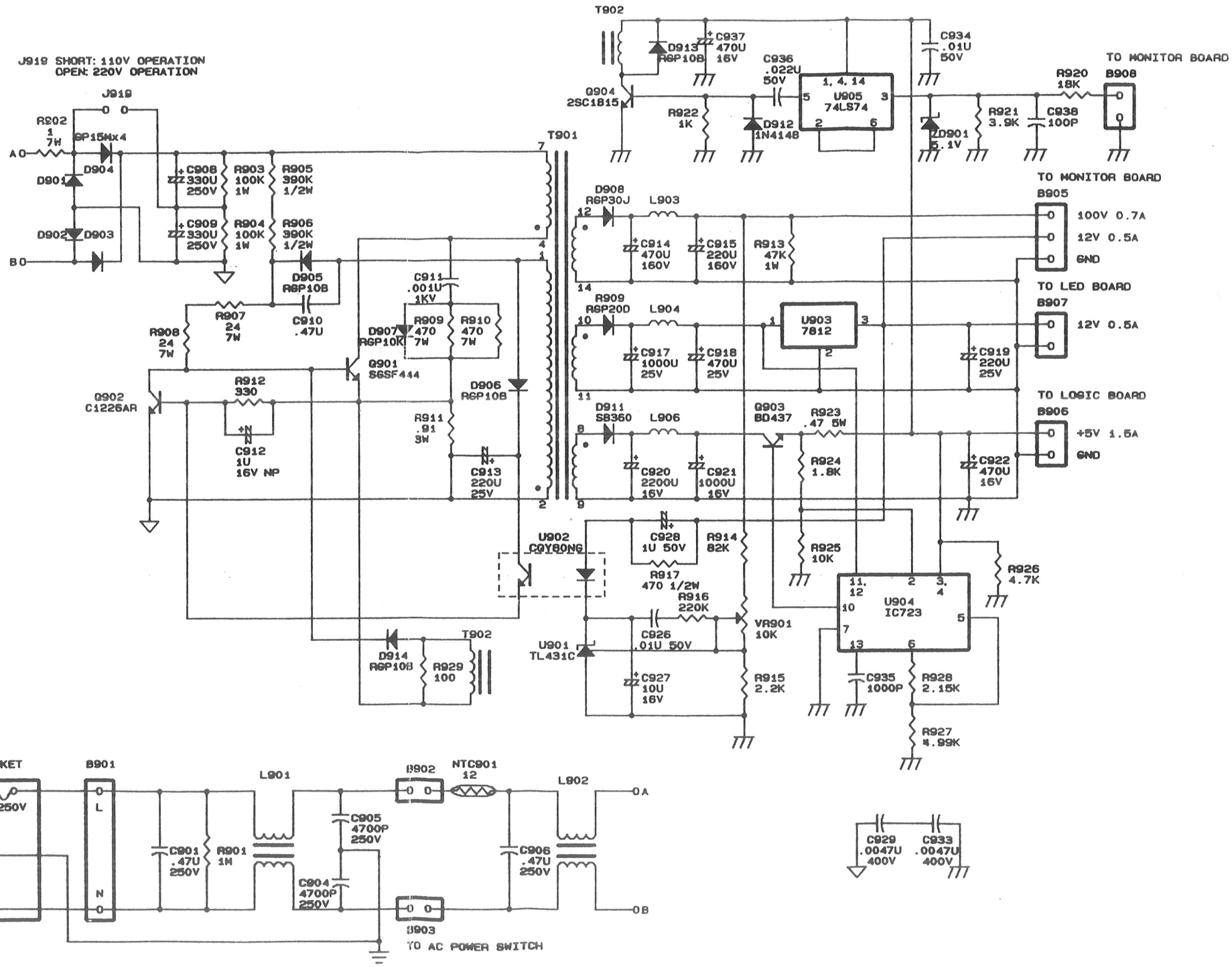
MONITOR BOARD LAYOUT

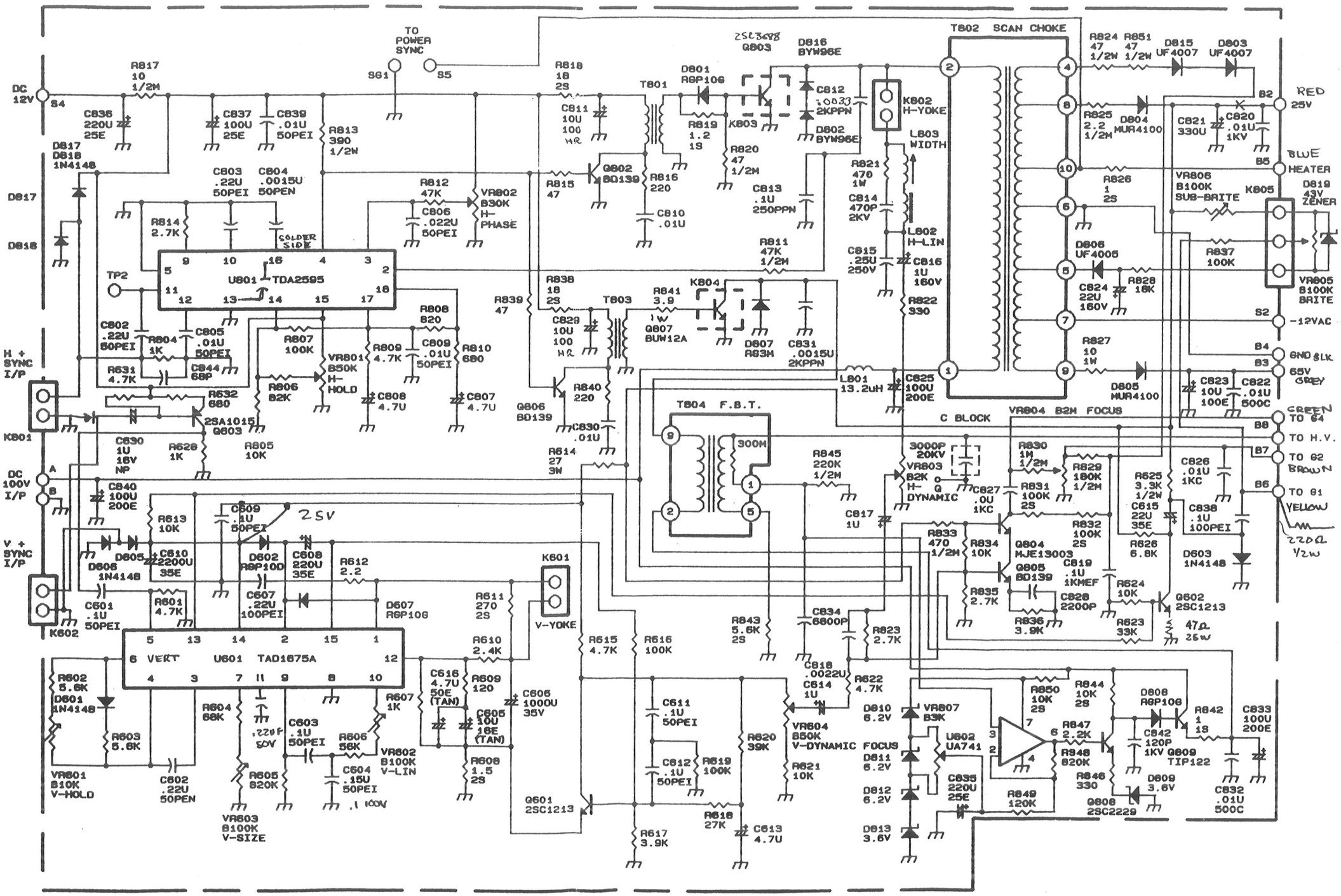


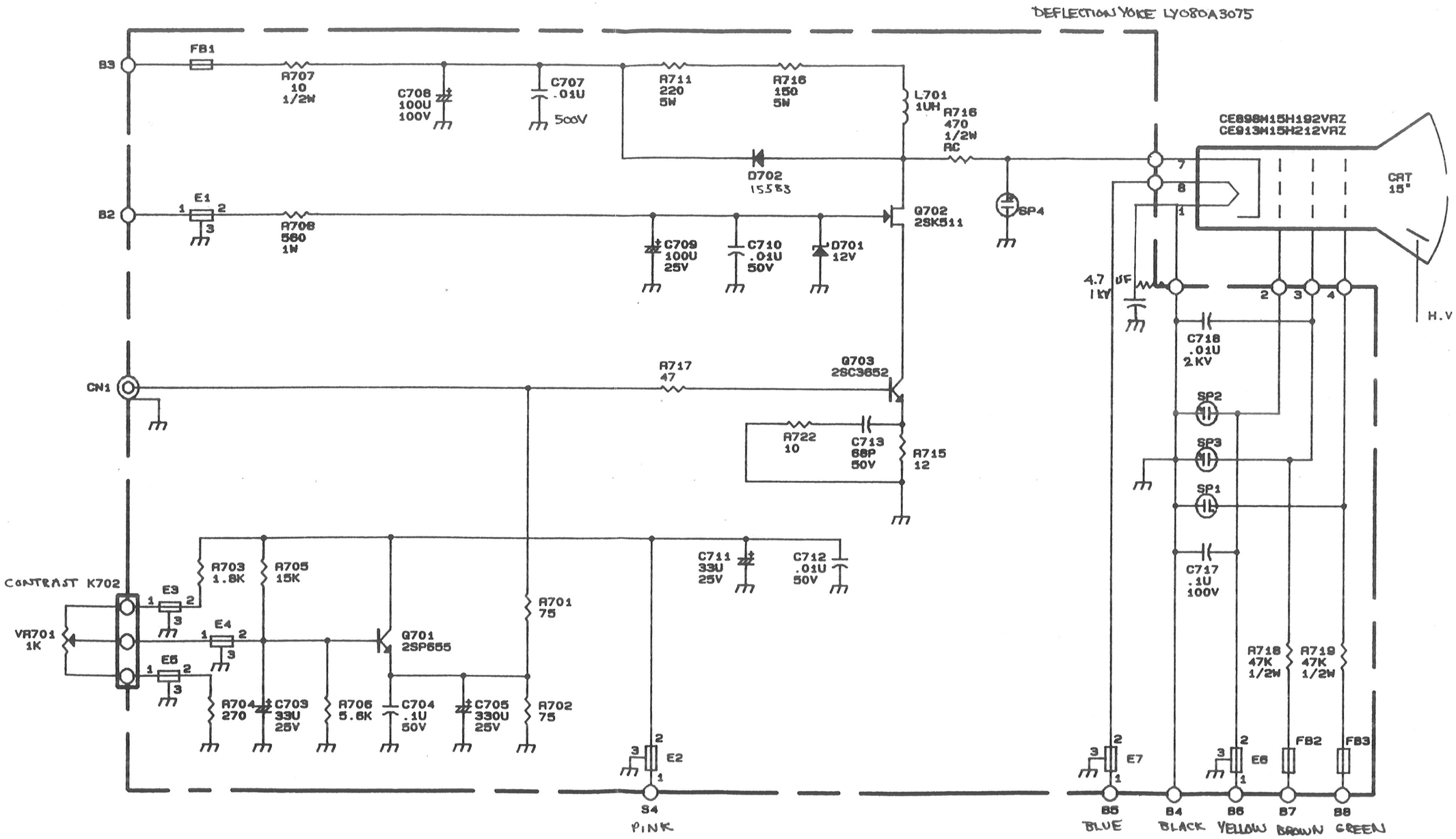
MONITOR BOARD LAYOUT

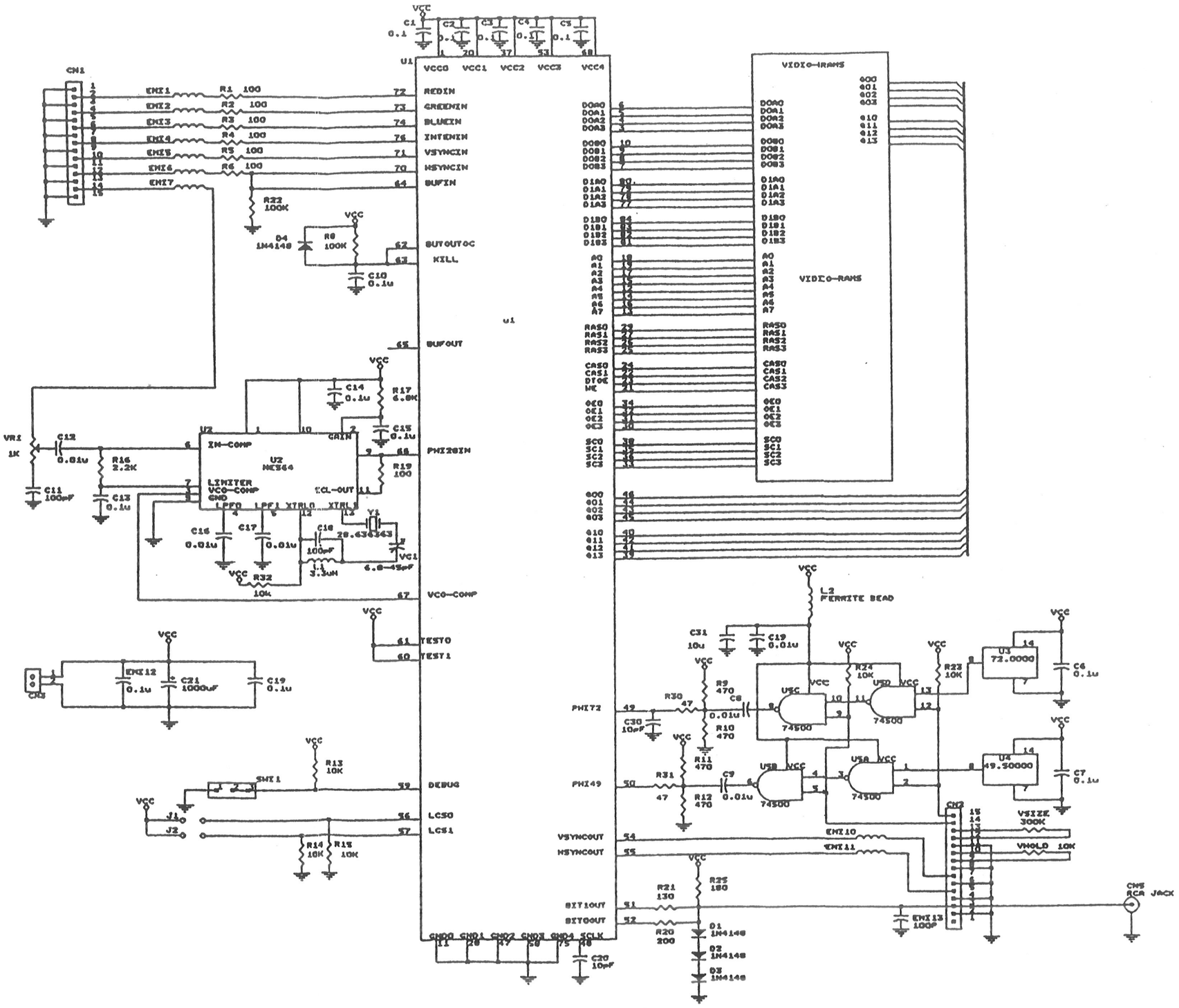
SECTION 5

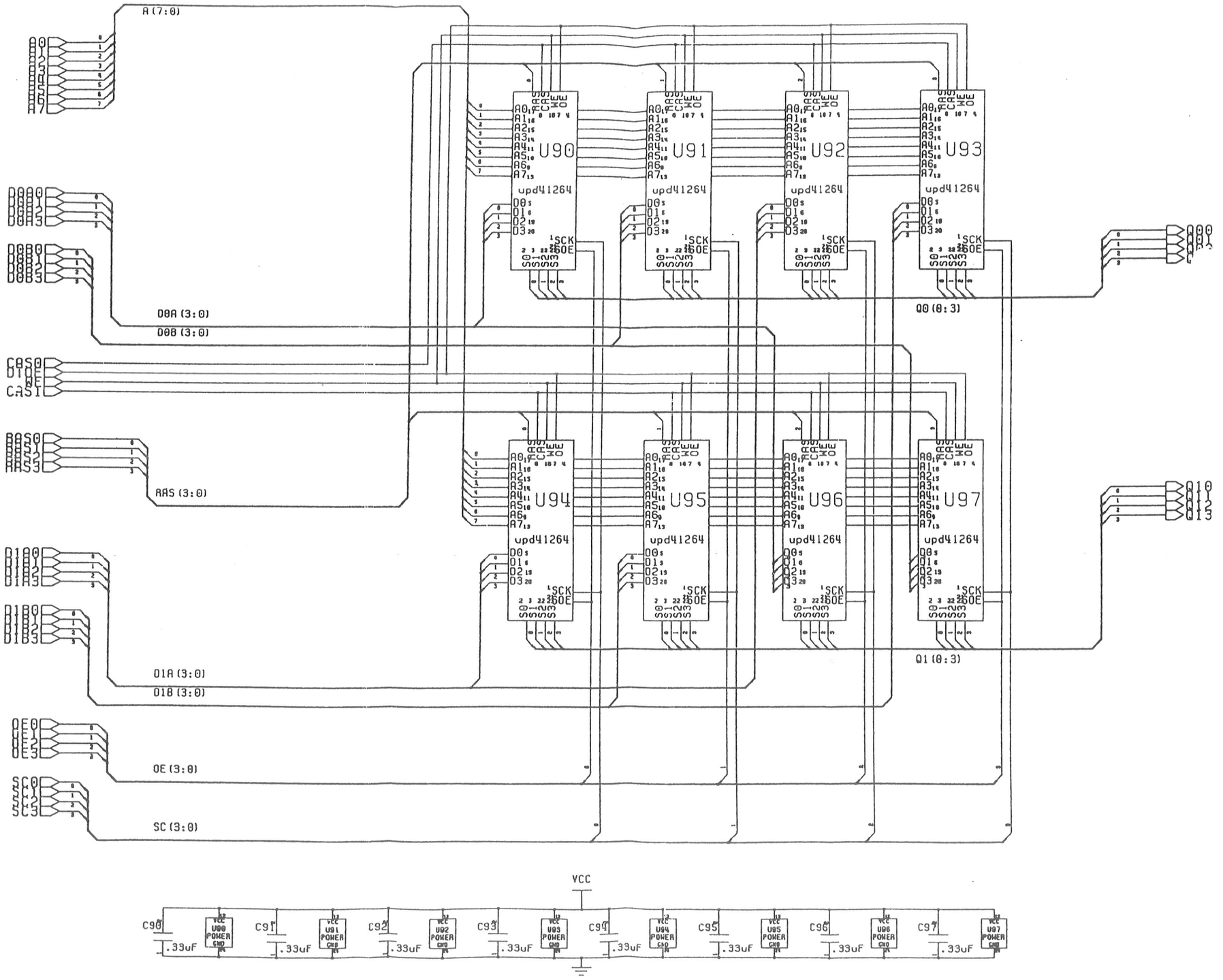
SCHEMATICS


J918 SHORT: 110V OPERATION
OPEN: 220V OPERATION
J919
RS02
1
7W
SP15Mx4
AC
BD
D901
D902
D903
D904
C908
330U
250V
C908
330U
250V
R903
100K
1W
R904
100K
1W
R905
390K
1/2W
R906
390K
1/2W
D905
RGP10B
C910
.47U
R907
24
7W
R908
24
7W
C911
.001U
1KV
D907
RGP10K
R909
470
7W
R910
470
7W
Q901
SGSF444
Q902
C1226AR
R912
330
C912
1U
16V NP
R911
.91
3W
D906
RGP10B
C913
220U
25V
T901
T902
D913
RGP10B
C937
470U
16V
Q904
2SC1815
R922
1K
C936
.022U
50V
D912
1N4148
U905
74LS74
C934
.01U
50V
ZD901
5.1V
R921
3.9K
C938
100P
R920
18K
B908
TO MONITOR BOARD
D908
RGP30J
L903
C914
470U
160V
C915
220U
160V
R913
47K
1W
B905
100V 0.7A
12V 0.5A
GND
TO MONITOR BOARD
R909
RGP20D
L904
U903
7812
C917
1000U
25V
C918
470U
25V
C919
220U
25V
B907
12V 0.5A
TO LED BOARD
D911
SB360
L906
Q903
BD437
R923
.47 5W
C920
2200U
16V
C921
1000U
16V
R924
1.8K
C922
470U
16V
B906
+5V 1.5A
GND
TO LOGIC BOARD
U902
C9Y80N6
C928
1U 50V
R914
82K
R925
10K
R926
4.7K
R917
470 1/2W
R916
220K
C926
.01U 50V
VR901
10K
U901
TL431C
C927
10U
16V
R915
2.2K
U904
IC723
C935
1000P
R928
2.15K
R927
4.99K
T902
D914
RGP10B
R929
100
AC SOCKET
2A/250V
L
FG
N
B901
L
N
L901
C901
.47U
250V
R901
1M
C905
4700P
250V
C904
4700P
250V
B902
NTC901
12
B903
TO AC POWER SWITCH
L902
C906
.47U
250V
OA
OB
C929
.0047U
400V
C933
.0047U
400V


TO POWER SYNC
S61
S5
DC 12V
S4
R817 10 1/2M
C836 220U 25E
C837 100U 25E
C839 .01U 50PEI
R813 390 1/2W
D817 D818 1N4148
C803 .22U 50PEI
C804 .0015U 50PEN
R814 2.7K
SOLDER SIDE
R812 47K
C806 .022U 50PEI
VR802 B30K H-PHASE
TP2
U801 TDA2595
R818 18 2S
C811 10U 100 HR
R815 47
Q802 BD139
R816 220
C810 .01U
T801
D801 BAP106
R819 1.2 1S
R820 47 1/2M
K803
2SC3678 Q803
D816 BYW96E
D802 BYW96E
C812 .0033 2KPPN
C813 .1U 250PPN
R811 47K 1/2M
K802 H-YOKE
L803 WIDTH
R821 470 1W
C814 470P 2KV
L802 H-LIN
C815 .25U 250V
C816 1U 160V
R822 330
TB02 SCAN CHOKE
R824 47 1/2W
R851 47 1/2W
D815 UF4007
D803 UF4007
B2
RED 25V
R825 2.2 1/2M
D804 MUR4100
C821 330U
C820 .01U 1KV
B5
BLUE HEATER
R826 1 2S
VR806 B100K SUB-BRITE
K805
D819 43V ZENER
D806 UF4005
R837 100K
C824 22U 160V
R828 18K
VR805 B100K BRITE
S2
-12VAC
R827 10 1W
D805 MUR4100
B4
GND &LK
B3
65V GREY
C823 10U 100E
C822 .01U 500C
B8
GREEN TO G4
TO H.V.
B7
TO G2 BROWN
B6
TO G1 YELLOW
220Ω 1/2W
C826 .01U 1KC
C838 .1U 100PEI
D603 1N4148
R838 18 2S
R839 47
T803
R841 3.9 1W
Q807 BUW12A
K804
D807 R83M
C831 .0015U 2KPPN
C829 10U 100 HR
R840 220
Q806 BD139
C830 .01U
R614 27 3W
T804 F.B.T.
L801 13.2uH
C825 100U 200E
C BLOCK
VR804 B2M FOCUS
3000P 20KV
VR803 B2K H- DYNAMIC
C827 .0U 1KC
R845 220K 1/2M
C817 1U
R830 1M 1/2M
R831 100K 2S
R829 180K 1/2M
R832 100K 2S
R833 470 1/2M
R834 10K
Q804 MJE13003
Q805 BD139
C819 .1U 1KMEF
C828 2200P
R835 2.7K
R836 3.9K
R625 3.3K 1/2W
C615 22U 35E
R626 6.8K
R624 10K
R823 33K
Q802 2SC1213
47Ω 25W
R808 820
R807 100K
VR801 B50K H-HOLD
R809 4.7K
C809 .01U 50PEI
R810 680
C808 4.7U
C807 4.7U
R806 82K
R805 10K
R631 4.7K
C844 68P
R632 680
2SA1015 Q603
R628 1K
C802 .22U 50PEI
C805 .01U 50PEI
R804 1K
C830 1U 16V NP
K801
H + SYNC I/P
DC 100V I/P
V + SYNC I/P
K602
C840 100U 200E
R613 10K
C609 .1U 50PEI
25V
D605
C610 2200U 35E
D606 1N4148
C601 .1U 50PEI
R601 4.7K
D602 BAP100
C607 .22U 100PEI
C608 220U 35E
R612 2.2
D607 BAP106
K601
V-YOKE
R611 270 2S
R610 2.4K
C616 4.7U 50E (TAN)
R609 120
C605 10U 16E (TAN)
R608 1.5 2S
C606 1000U 35V
R607 1K
VR802 B100K V-LIN
C604 .15U 50PEI
R606 56K
C603 .1U 50PEI
R605 820K
VR603 B100K V-SIZE
R604 68K
.220P 50V
R602 5.6K
D601 1N4148
R603 5.6K
VR601 B10K V-HOLD
C602 .22U 50PEN
Q601 2SC1213
R615 4.7K
R616 100K
R617 3.9K
R618 27K
C613 4.7U
C611 .1U 50PEI
C612 .1U 50PEI
R619 100K
R620 39K
R621 10K
VR804 B50K V-DYNAMIC FOCUS
R843 5.6K 2S
C834 6800P
C818 .0022U
C614 1U
R823 2.7K
R622 4.7K
D810 6.2V
D811 6.2V
D812 6.2V
D813 3.6V
VR807 B3K
U802 UA741
C835 220U 25E
R849 120K
R850 10K 2S
R844 10K 2S
R847 2.2K
R948 820K
R846 330
Q808 2SC2229
D808 BAP106
C842 120P 1KV
D809 3.6V
R842 1 1S
Q809 TIP122
C833 100U 200E
C832 .01U 500C


DEFLECTION YOKE LY080A3075
B3
FB1
R707
10
1/2W
C708
100U
100V
C707
.01U
500V
R711
220
5W
R716
150
5W
L701
1UH
R716
470
1/2W
AC
D702
1SS83
CE898M15H192VRZ
CE913M15H212VRZ
CRT
15"
B2
E1
R708
560
1W
C709
100U
25V
C710
.01U
50V
D701
12V
Q702
2SK511
SP4
4.7
1 KV
uF
C718
.01U
2 KV
H.V
CN1
R717
47
Q703
2SC3652
R722
10
C713
68P
50V
R715
12
SP2
SP3
SP1
C717
.1U
100V
CONTRAST K702
VR701
1K
E3
E4
E5
R703
1.8K
R705
15K
R704
270
C703
33U
25V
R706
5.6K
C704
.1U
50V
C705
330U
25V
R702
75
Q701
2SP655
R701
75
C711
33U
25V
C712
.01U
50V
E2
S4
PINK
R718
47K
1/2W
R719
47K
1/2W
E7
E6
FB2
FB3
B5
B4
B6
B7
B8
BLUE
BLACK
YELLOW
BROWN
GREEN


VCC
C1 0.1
C2 0.1
C3 0.1
C4 0.1
C5 0.1
U1
VCC0 VCC1 VCC2 VCC3 VCC4
CN1
EMI1
EMI2
EMI3
EMI4
EMI5
EMI6
EMI7
R1 100
R2 100
R3 100
R4 100
R5 100
R6 100
REDIN
GREENIN
BLUEIN
INTENIN
VSYNCIN
HSYNCIN
BUFIN
R22 100K
D4 1N4148
R8 100K
BUFOUTOC
KILL
C10 0.1u
BUFOUT
C14 0.1u
R17 6.8K
C15 0.1u
PHI2OIN
R19 100
VR1 1K
C12 0.01u
R16 2.2K
C11 100pF
C13 0.1u
U2
IM-COMP
GAIN
U2 MK564
LIMITER
VCO-COMP
GND
LPF0 LPF1 XTAL0 XTAL1
VCL-OUT
Y1
28.636363
C16 0.01u
C17 0.01u
C18 100pF
VC1 6.8-45pF
L1 3.3uH
R32 10K
VCO-COMP
TEST0
TEST1
CN3
EMI12
C21 1000pF
C19 0.1u
R13 10K
SMT1
DEBUG
J1
J2
LCS0
LCS1
R14 10K
R15 10K
VIDEO-IRAMS
VIDEO-RAMS
u1
DOA0 DOA1 DOA2 DOA3
DOB0 DOB1 DOB2 DOB3
D1A0 D1A1 D1A2 D1A3
D1B0 D1B1 D1B2 D1B3
A0 A1 A2 A3 A4 A5 A6 A7
RAS0 RAS1 RAS2 RAS3
CAS0 CAS1 CAS2 CAS3
DTOE WE
OE0 OE1 OE2 OE3
SC0 SC1 SC2 SC3
Q00 Q01 Q02 Q03
Q10 Q11 Q12 Q13
L2 FERRITE BEAD
C31 10u
C19 0.01u
R24 10K
R23 10K
U3 72.0000
C6 0.1u
R9 470
C8 0.01u
R30 47
C30 10pF
R10 470
PHI72
74S00
R11 470
C9 0.01u
R31 47
R12 470
PHI49
U4 49.50000
C7 0.1u
CN2
VSIZE 300K
VHOLD 10K
EMI10
EMI11
VSYNCOUT
HSYNCOUT
R21 130
R20 200
R25 180
D1 1N4148
D2 1N4148
D3 1N4148
BIT1OUT
BIT0OUT
EMI13 100P
CMS RCA JACK
GND0 GND1 GND2 GND3 GND4 SCLK
C20 10pF


A(7:0)
D0A(3:0)
D0B(3:0)
CASO
CAS1
RAS0
RAS (3:0)
D1A0
D1B0
D1A(3:0)
D1B(3:0)
OE0
OE (3:0)
SC0
SC (3:0)
U90
U91
U92
U93
U94
U95
U96
U97
upd41264
Q0(0:3)
Q1(0:3)
Q10
Q11
Q12
Q13
VCC
C90
C91
C92
C93
C94
C95
C96
C97
.33uF